

***Sisymbrium irio* L. (London-rocket):**
its status in Britain and Ireland



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Abstract

Sisymbrium irio is a rare plant in Britain and Ireland. The history of its distribution and changes in its population size are traced and analysed from its discovery in about 1650. It has been claimed as native but also regarded as an introduction. Its native/alien status is discussed against the criteria proposed by Webb (1985). Its ecology in terms of habitat and associated species was investigated and the results are presented. *Sisymbrium irio* was found to be a neophyte occurring persistently in a very limited number of locations and as a casual in almost all its known locations in the British Isles. It does not appear to be a member of a recognised community within the National Vegetation Classification. Its earlier flowering in East London is reported and the suggestion made that it could increase in numbers in the immediate future as a result of warmer summers and milder winters.

Acknowledgements

I am grateful for assistance received from staff of the Herbaria at Manchester Museum and the Natural History Museum, London and from volunteers at the South London Botanical Institute. The staff of the General Library and the Palaeontology Library at the Natural History Museum helped track down literature sources and the staff of the Botany Library were particularly helpful in that respect. Alex Lockton produced maps using Alan Morton's D-map software from data supplied. I am also grateful to Alex Lockton for drawing my attention to the Ordnance Survey Did you know... ? website <http://www.ordnancesurvey.co.uk/oswebsite/freefun/didyouknow/>, which proved useful for tracking down the grid references of sites, and to Gwynn Ellis for help with Welsh place names.

Alex Lockton in his capacity as Co-ordinator of the Botanical Society of the British Isles (BSBI) supplied me with the dataset for *Sisymbrium irio* from the BSBI Vascular Plants Database as supplied to the Biological Records Centre. This data is referred to as BRC in Appendix 1. I acknowledge the information provided for their respective counties by the BSBI Vice-county Recorders for Middlesex (Rodney Burton), for Bedfordshire (Chris Boon) and for South-west Yorkshire (Geoffrey Wilmore). Gordon Hanson supplied me with detailed information on *Sisymbrium irio* as a shoddy field weed in Bedfordshire and North Hampshire and Bill Thompson provided me with data from Worcestershire and a copy of Christina Dony's typescript about wool adventives in that county (Dony, 1989).

I am grateful for general encouragement from Sarah Whild and Alex Lockton my Birmingham University tutors, from Martin Godfrey and Andrew Leak, and from David Bevan, Chair of the Botany Section of the London Natural History Society. Sylvia Reynolds encouraged me to follow up records in Co. Dublin and determined *Conyza bilbaoana* for me, and David Bevan, Jeremy Ison, Terry Lyle, and Mark Spencer provided me with recent field records in London. I should also record the forbearance of my wife Diane concerning the time it all took.

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References

1. Sources consulted to compile the table of records (Appendix 1)
2. Sources referred to in the text of the dissertation

Cover picture: *Sisymbrium irio* in Camden Place, Dublin, photographed by R.J. Swindells on 28 May 2006.

Sisymbrium irio L. (London-rocket), its status in Britain and Ireland: a
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Introduction

Sisymbrium irio L. (London-rocket) is an annual or overwintering herb of the family Brassicaceae (Cruciferae), (Clapham, Tutin and Moore, 1987 and Stace, 1997). It has the flowers with relatively small obovate, yellow petals, the more or less terete fruits and the simple hairs characteristic of the genus *Sisymbrium*. It may be distinguished from other European species of the genus by its condensed inflorescence in which the slender young torulose fruits overtop the flowers and buds (Rich, 1991 and Tutin, *et al.*, 1993).

The first printed record for *Sisymbrium irio* in the British Isles was in 1666 from the City of London in vice-county 21, Middlesex (Merrett, 1666 and 1667, quoted in Clarke, 1900). According to the latest *Vice-county census catalogue* (Stace, *et al.*, 2003) it has subsequently been recorded from 48 other vice-counties in Britain but, since 1970 in a total of seventeen. Reynolds (2002) lists three vice-counties historically for Ireland but only one since 1970. It is still (Stace, *et al.*, 2003), or perhaps again (Burton 1983) to be found in vice-county 21.

Clapham, Tutin and Warburg (1962) call it “doubtfully native”. 25 years later Clapham, Tutin and Moore (1987) describe it as “probably not native”. Clement and Foster (1994) describe it as “an early colonist which has been claimed as native”. Rich (1991), and Stace (1997) unequivocally call it an introduction and Pearman (2002) in the *New atlas* (Preston *et al.*, 2002) describes it as a neophyte occasionally naturalised.

Typical habitats cited for *Sisymbrium irio* in Britain and Ireland are waste places, in pavement cracks and on roadside banks and walls (Pearman, 2002). Pearman notes that though sometimes naturalised, it is more frequently found as a casual “sometimes with grain imports and formerly as a wool alien”. In South-west Yorkshire (vice-county 63) and a few other vice-counties it has been one of a number of species associated with the use of wool shoddy on arable fields. Wilmore (2000) describes it as a species of frequent occurrence in such fields, “often with sizeable populations present”. It has occurred in a number of urban locations and been persistent in London and Dublin (Rich, 1991).

Aims

The aims of this dissertation are to test the accuracy of statements about distribution, habitat and status quoted in the introduction, and in particular:

1. to determine the distribution of *Sisymbrium irio* in Britain and Ireland since its first discovery in the 1650s and to analyse the changes, if any, in that distribution;
2. to determine whether or not *Sisymbrium irio* is a native species in Britain and Ireland; and
3. to explore whether *Sisymbrium irio* forms part of a distinct plant community within the National Vegetation Classification..

Methods

Using information from the *Vice-county census catalogue* (Stace, *et al.*, 2003), the *Census catalogue of the flora of Ireland* (Scannell and Synnott, 1987) and Reynolds (2002) as starting points, data were collected from:

- published sources, notably the principal county and regional floras of Britain and Ireland;
- labels on herbarium sheets in the Natural History Museum, London (**BM**), Manchester Museum (**MANCH**), the South London Botanical Institute(**SLBI**) in person, and other small herbaria electronically;
- records held by the Biological Records Centre;
- correspondence with selected BSBI Vice-county Recorders and other individuals.

From those data a table of records was compiled (**Appendix 1**).

The records in **Appendix 1** were analysed by fifty year date classes, the results presented in a series of maps, graphs and tables to demonstrate any changes in distribution geographically and historically, and a narrative commentary produced drawing on those records and the observations of earlier botanists. Additionally the plant's distribution in Britain and Ireland as displayed in the maps in Perring and Walters (1962) and Preston, *et al.* (2002) is compared and the status of *Sisymbrium irio* in the vice-counties in which it was present during 1930-1961 and 1970-1999 is reviewed.

Field records were collected in London and Dublin to add to the data about distribution, abundance, habitat requirements and associated species derived from published sources and to determine whether *Sisymbrium irio* may be a constituent of a particular plant community within the National Vegetation Classification.

The worldwide distribution of *Sisymbrium irio* was investigated and is discussed in relation to its British and Irish distribution and the claim that it may be native.

Published information about the habitats of *Sisymbrium irio* is reviewed with particular reference to the statements of Pearman (2002).

Findings from the literature and field records are tested against the criteria proposed by Webb (1985) to determine native/alien status and discussed in the light of other published criteria for recognition of a species as native, archaeophyte or neophyte and to determine whether *Sisymbrium irio* is established or casual.

RESULTS

The table of records (Appendix 1)

The literature and other records were assigned to 10 Km squares of the National Grid and arranged in vice-county order in the table that forms **Appendix 1**. The table includes over 370 records from 58 vice-counties and 128 x 10 Km squares. This compares with records from 51 squares in Perring and Walters (1962) and 87 squares in Preston, *et al.* (2002). Though included in the table about five of the records could not be assigned to squares. Three examples may suffice: “Bristol” with no further detail could refer to any one of several squares; “Ardsley” probably means East Ardsley or “Ardsley East” as it appears on some maps, from which there are other records, rather than the Ardsley near Barnsley in the same vice-county. Kingsbridge in Co. Dublin (which may have changed its name since Ireland became a republic) was not traced.

Analysis of the records

The 10 Km squares were analysed by fifty year date classes. A few squares were excluded because the published records provided insufficient or confusing detail about the dates concerned. In one or two cases, where indicated in **Appendix 1**, they were allocated to a date class. **Figure 1** shows, in graph form, the number of squares in which *Sisymbrium irio* was recorded in each fifty year period.

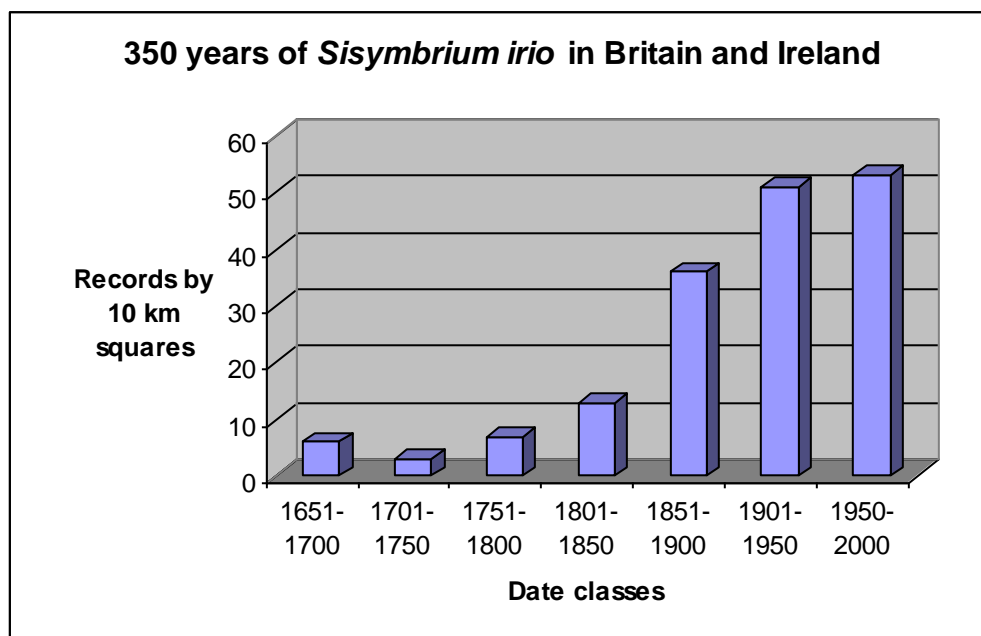


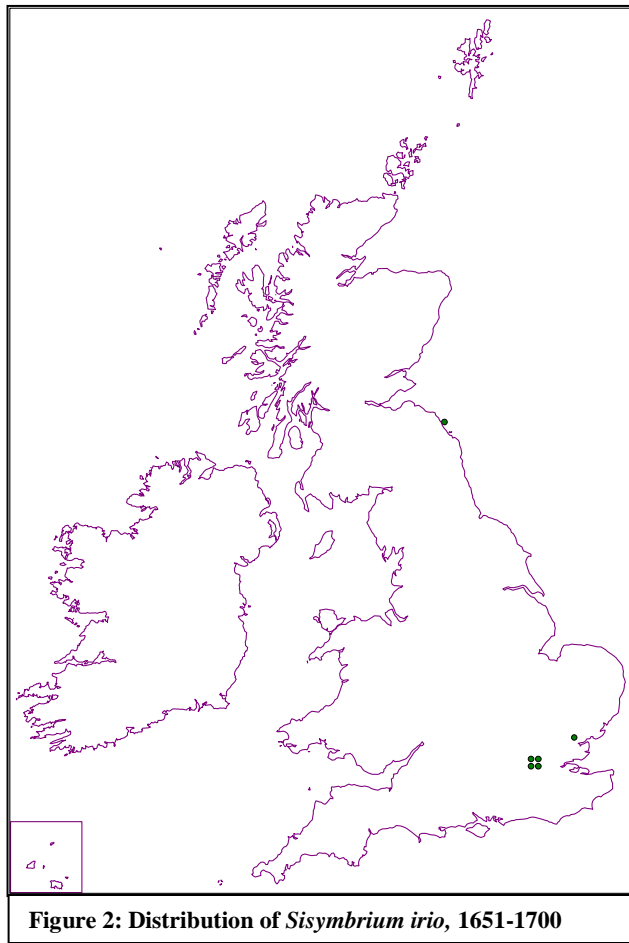
Figure 1: The presence of *Sisymbrium irio* in fifty year date classes

A summary of changes in distribution is presented in **Table 1** below. Detailed data for the seven date classes by 10 Km square are in the bar chart that forms **Appendix 2**.

Table 1: Changes in the distribution of *Sisymbrium irio* by fifty year date classes

Date classes/squares per date class	Losses	Gains	No change	Net change	% change
1651-1700 to 1701-1750 6 3	4	1	2	-3	-50.00%
1701-1750 to 1751-1800 3 7	1	5	2	+4	+133.33%
1751-1800 to 1801-1850 7 13	2	8	5	+6	+85.71%
1801-1850 to 1851-1900 13 36	9	32	4	+23	+176.92%
1851-1900 to 1901-1950 36 51	26	41	10	+15	+41.66%
1901-1950 to 1951-2000 51 53	44	46	7	+2	+3.92%

An historical commentary on the data presented in **Appendix 1**, **Appendix 2**, **Figure 1** and **Table 1** follows together with a dot distribution map for each date class.



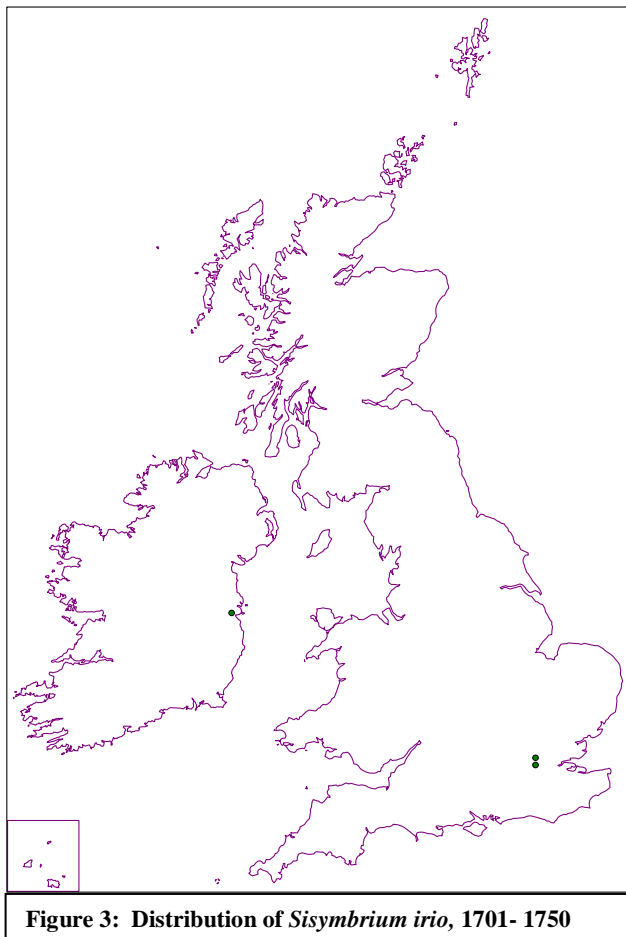
Records from c. 1651 to 1700

In this period *Sisymbrium irio* was recorded in six 10 Km squares, four covering London and its surroundings and two elsewhere. Merrett (1666), Ray (1670) and others wrote of its abundance in 1667 and 1668 on the ruins of St. Paul's Cathedral after the Great Fire in the City of London but it was also known from near King's Cross (Kent, 1975), between the City and Kensington, and "copiously about Chelsea" (Ray, 1670 and Trimen &

Dyer, 1869, quoting Morison). Ray "also observed it elsewhere, as about the House of my honoured Friend... at Faulkbourn in Essex [where Ray himself had lived from 1677 to 1679 (Bryan, 2005)]; also on the walls of Berwick upon Tweed" (Ray, 1690).

Though the first printed record for *Sisymbrium irio* was in Merrett (1666) it had, in fact, been observed at least ten years earlier. There is a MS note in William How's handwriting in his own copy of his *Phytologia Britannica* (How, 1650, quoted by Günther, 1922), attributing its discovery to John Goodyer "near White Chappel east from Aldgate, London", i.e. just east of the City of London. The MS note must have been

written after 1650 when *Phytologia Britannica* was published and before 1656 when How died. When Goodyer *actually* saw *Sisymbrium irio* is another matter but clearly it was before 1656. Tantalisingly there is a specimen in the Natural History Museum, London (**BM**) with Goodyer's name on it but no date or location. That Goodyer was a competent botanist is attested to by Thomas Johnson (c.1604 to 1644) who described Goodyer as “a man second to none in his industrie and searching after plants nor in his judgement or knowledge of them” and Johnson had planned to work with him to produce a complete descriptive flora of Britain (Gilmour, 1944).



Records from 1701 to 1750

This is the thinnest period for records with the species only recorded as present in three 10 Km squares, two in the London area and one in Dublin.

Near London it was reported from between Brick Lane (east of the City in Spitalfields) and Islington (to the north of the City). This was a period of much new building in Spitalfields with the arrival of Huguenot refugees

from France (Rose, 1951). The Dublin

record is accepted on the basis that Caleb Threlkeld's record in 1727 of *Eruca sylvestris vulgator* which “grows upon Walls as between *Dolphin's Barn* and *Cork Bridge*” should

be referred to *Sisymbrium irio* as Colgan (1904) suggests. The species has certainly been found subsequently in the neighbourhood of Dolphin's Barn.

The third edition of Ray's *Synopsis methodica Stirpium Britannicarum...* (Ray, 1724) still included the records for Faulkbourn[e] Hall and Berwick upon Tweed (counted in the previous date class) but as these were not independently corroborated they have been excluded from the table of records for 1701-1750. In the case of Berwick upon Tweed, however, it was to be recorded again in three successive 50 year periods from 1801.

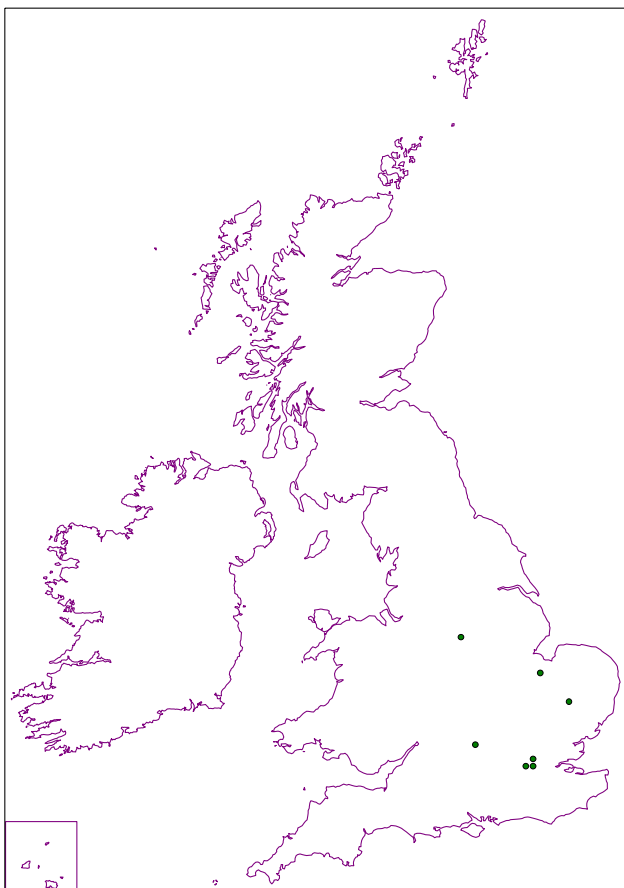


Figure 4: Distribution of *Sisymbrium irio*, 1751- 1800

Records from 1751 to 1800

In percentage terms there was a marked expansion of range, of 133.33%, over the previous period but the net increase amounts to only four squares. *Sisymbrium irio* retained its presence in the London area and was recorded “in great abundance” between Little Chelsea and Hyde Park Corner in the last decade (Trimen & Dyer, 1869). Of the new records, those from Wisbech, Bury St Edmunds and Wingfield Manor in

Derbyshire may be regarded as casual occurrences, though *Sisymbrium irio* was recorded again at Wisbech in 1801-1850. The one from Oxford was the first of many stretching over the following 230 years.

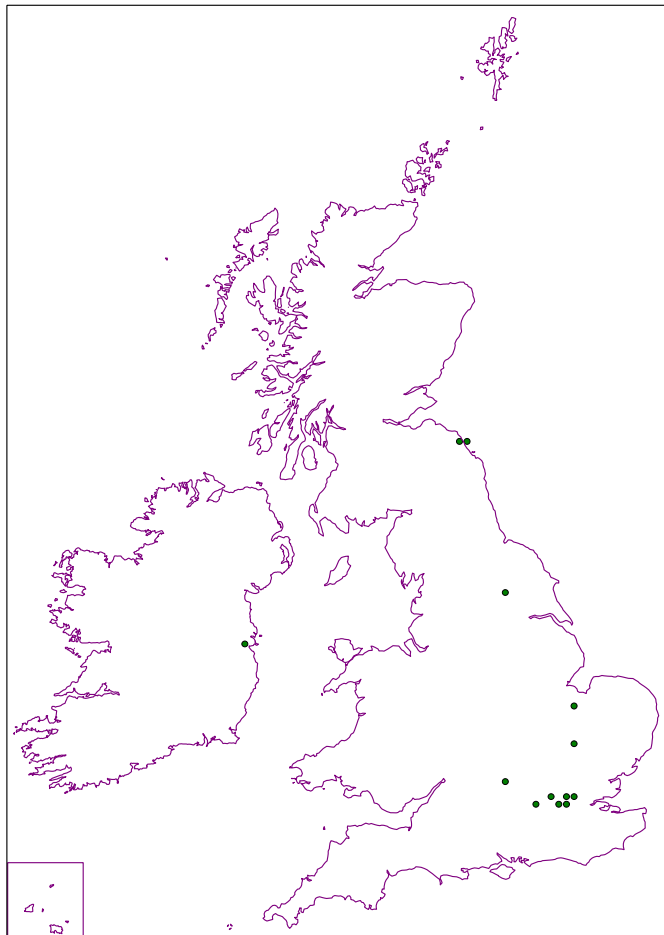


Figure 5: Distribution of *Sisymbrium irio*, 1801- 1850

Records from 1801 to 1850

There is a further expansion of range, by 85.71%, over the previous period with a net gain of six squares, including Slough, Barnwell in Cambridge, Hanwell west of London and Barking east of London. It was found on the city walls of York and was recorded again on the town walls of Berwick upon Tweed. Here the northing separating the NT and NU squares of the National Grid runs through the town and its walls. In this

period there is a specific reference to the appearance of *Sisymbrium irio* near to the new North British Railway station (Johnston, 1853) in NT95; all other records giving detailed locations refer to places in NU05 so the non-specific records for Berwick upon Tweed have all been assigned to NU05. Preston *et al.* (2002) incorrectly omit NU05 and include only NT95 in their pre-1970 date class. *Sisymbrium irio* was recorded as common in Dublin (Dublin Naturalists' Field Club, 1998) and continued to be present in Oxford; but

in the London area, though it started as “a troublesome weed” in Chelsea at the beginning of the period it had apparently disappeared by the end (Trimmen & Dyer, 1869).

Records from 1851 to 1900

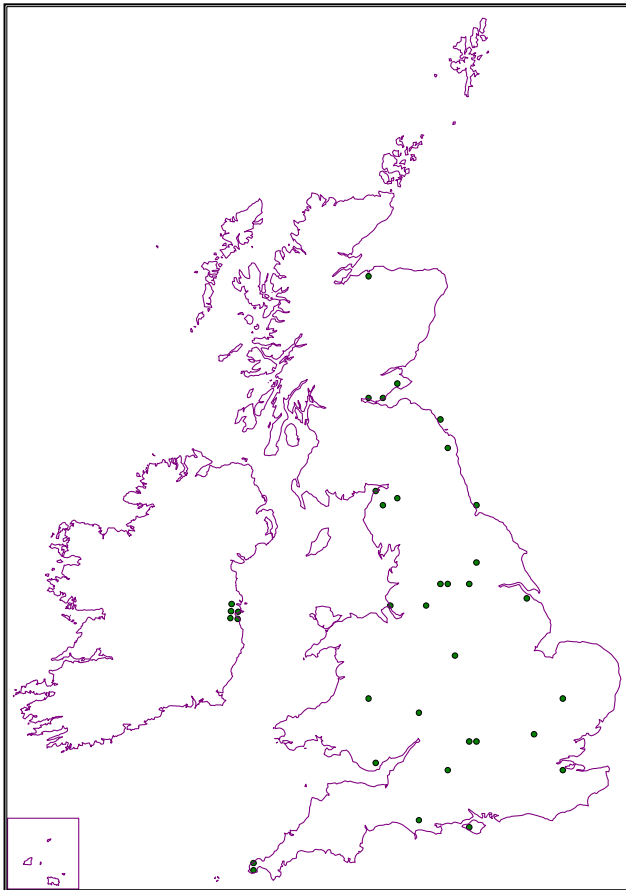
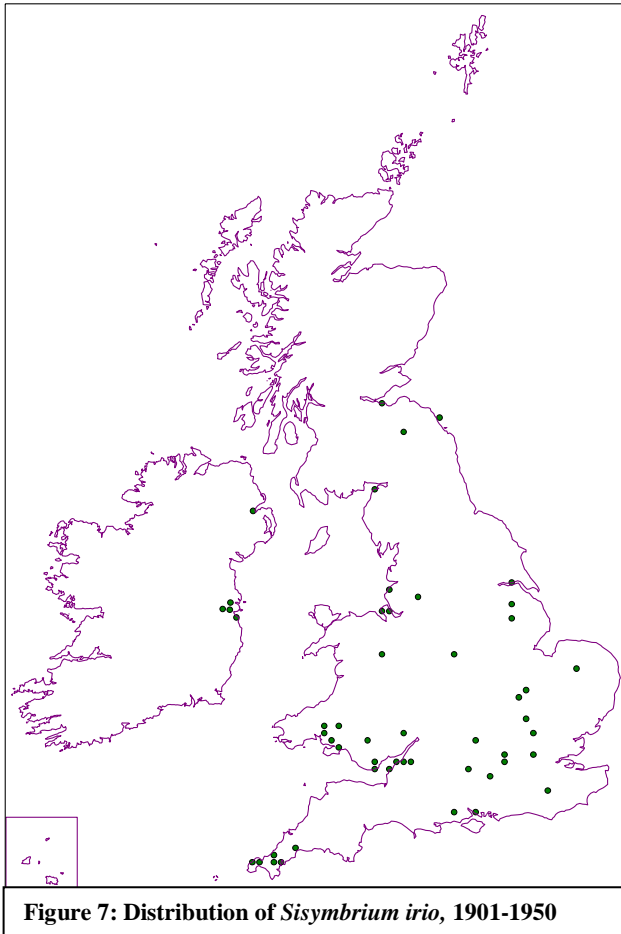


Figure 6: Distribution of *Sisymbrium irio*, 1851-1900

Expansion of range in 1851-1900 compared with the previous period was by 176.92%, a net gain of 23 squares. This period saw the first Scottish, Welsh, Cornish, Cumbrian and Lancastrian records plus the first and only records from Dorset and the Isle of Wight. There was an expansion of range in Yorkshire and in County Dublin but no certain records from London.

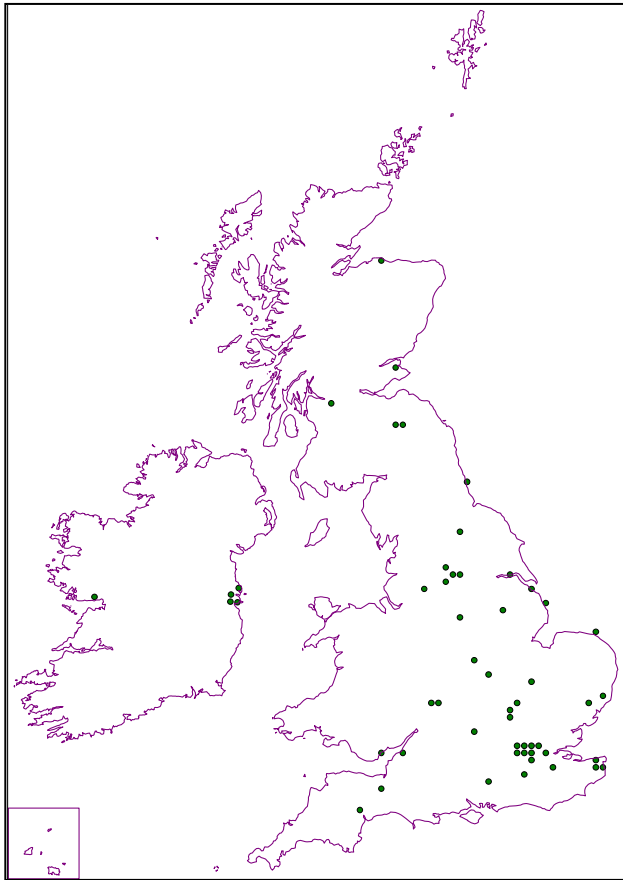
Records from 1901 to 1950



Expansion of range in 1901-1950 compared with the previous period was by 41.66%, a net gain of 15 squares. It appeared in Hull but was not recorded anywhere else in Yorkshire during the period. In Ireland there was a slight contraction of range in Dublin with a change from five to four squares but there were new records for Belfast, one in Co. Antrim and one in Co. Down, though both in the same square. There were a lot more records from Cornwall and

South Wales, many in coastal towns, and the first definite record for about one hundred years in London when it was found in Trinity Square Gardens near the Tower of London in 1945, the record vouched for by a specimen in **BM.**

Records from 1951 to 2000



When this most recent date class is compared with the previous one there is a change of +3.92%, i.e. a net increase of two squares. What is more significant, though, is that the losses (44) and the gains (46) are almost the same and compare with only seven squares unchanged. The losses are most marked in Cornwall and South Wales and the gains in Worcestershire, Yorkshire, East Kent and the London area. In Worcestershire, Yorkshire

and East Kent they are associated with the use of wool shoddy as a fertiliser on fruit and vegetable crops. Within the area of the Greater London Authority *Sisymbrium irio* was being found on disturbed ground, on rubbish tips, or as a street weed in eight 10 Km squares compared with only one in the previous fifty year period.

Figure 8: Distribution of *Sisymbrium irio*, 1951-2000

Changes in distribution between surveys for the two atlases

Another way of measuring change, if any, is to compare the distributions recorded in the two atlases of the British and Irish flora (Perring & Walters, 1962 and Preston, *et al.*, 2002). Preston, *et al.* (2002) provide figures for the numbers of 10 Km squares in each date class represented on the maps in the *New atlas*, thus:

1987-1999	21
1970-1986	12
Pre 1970	54
<i>All</i>	87

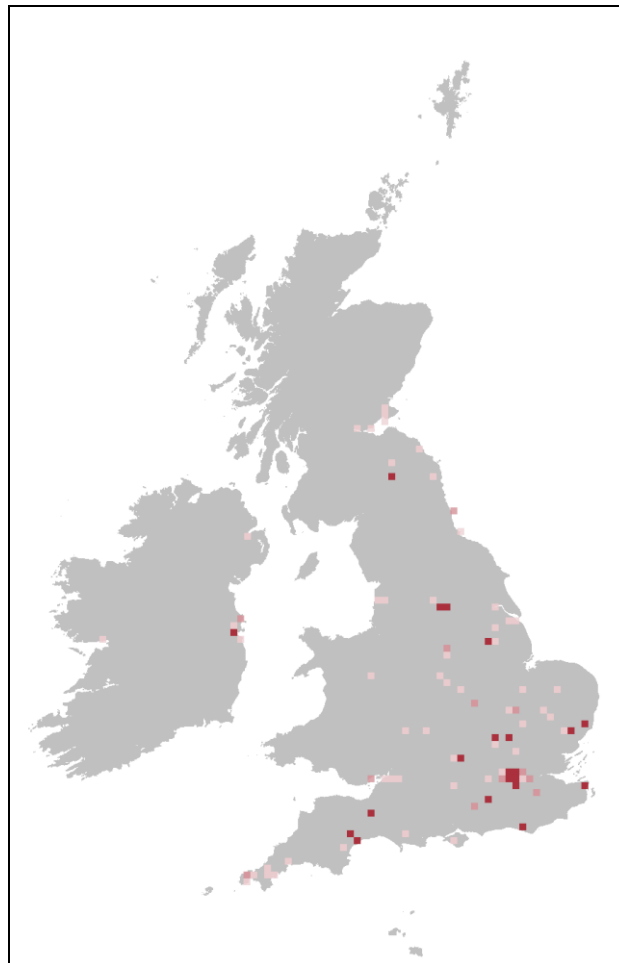


Figure 9: Distribution of *Sisymbrium irio* in Britain and Ireland from *New atlas of the flora of Britain and Ireland* (Preston, *et al.*, 2002)

The numbers of 10 Km squares for the two date classes represented on the maps in the original *Atlas* (Perring & Walters, 1962) are:

1930 onwards (i.e. to c. 1961)	33
Before 1930	18
<i>All</i>	51

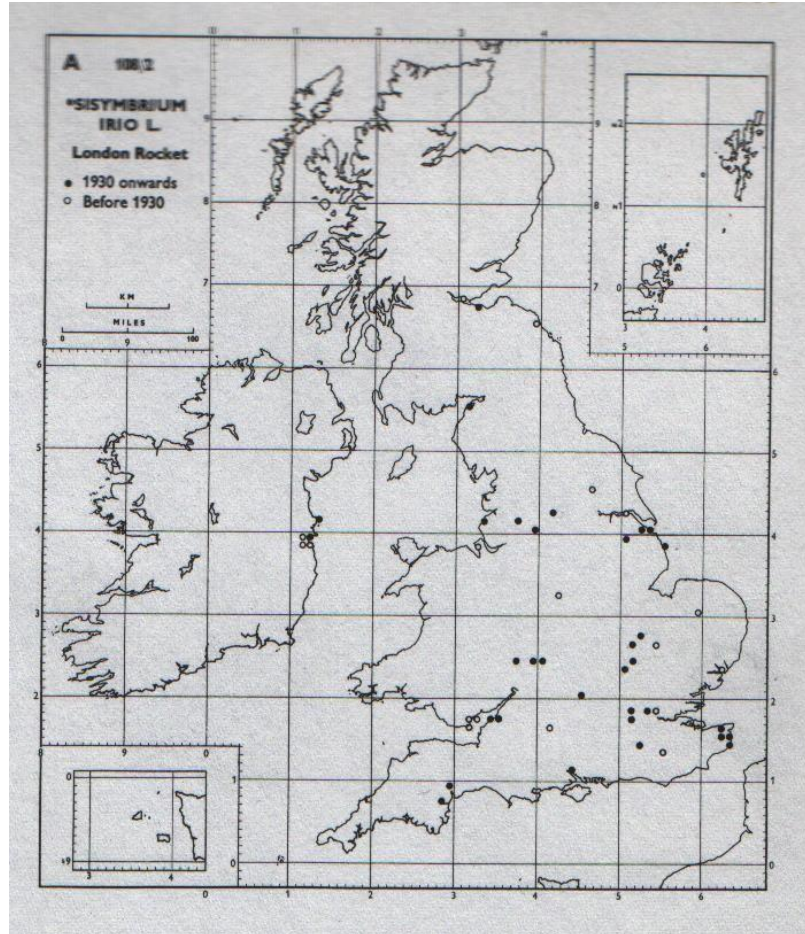


Figure 10: Distribution of *Sisymbrium irio* in Britain and Ireland from *Atlas of the British flora* (Perring & Walters, 1962)

Comparison of the most recent date class from each publication suggests a serious reduction in the distribution of *Sisymbrium irio* from 33 squares to 21 but that would be to compare a 32 year period with a 13 year period. It therefore seemed more appropriate to compare 32 years in the 1930 onwards date class of Perring & Walters with the 30 year period achieved by combining the two most recent date classes (1970-1986 and 1987-1999) of Preston, *et al.* This comparison suggests no change with both atlases displaying 33 x 10 Km squares for *Sisymbrium irio*.

However, analysis of these squares by vice-county shows that *Sisymbrium irio* was recorded in only 15 vice-counties in the 1930-1960 period but in 23 vice-counties in the 1970-1999 period, suggesting a more scattered distribution.

Further comparison of the data by vice-county shows that *Sisymbrium irio* was present in *both* periods in nine of them, namely:

3	South Devon
15	East Kent
17	Surrey
21	Middlesex
23	Oxfordshire
30	Bedfordshire
31	Huntingdonshire
63	South-west Yorkshire
H21	Co. Dublin

Examination of the records for these vice-counties in more detail may serve to illustrate the nature of the distribution of *Sisymbrium irio* over the years. What is the nature of the populations of *Sisymbrium irio* in these vice-counties? Is the species established or is it a casual that in some cases may be reinforced by continual re-introduction? For most of these vice-counties it is possible to trace the history of *Sisymbrium irio* by reference to the county floras and other data sources used to compile **Appendix 1**. The results of such research are summarised below.

Review of the status of *Sisymbrium irio* in the vice-counties in which it was recorded during 1930-1961 and 1970-1999

V-c. 3 South Devon

Keble Martin (1939) did not know the species in Devon. By the time the *Atlas of the Devon flora* was published (Ivimey-Cook, 1984) there were “no recent records” though it had “been found on walls and in waste places” in the past.

Lousley (1961) records a South Devon specimen, an example of a wool alien, in his own herbarium (now at **RNG?**) and there is a specimen from Exeter Docks in **BM**. *Sisymbrium irio* would appear to be merely a casual in South Devon.

V-c. 15 East Kent

Hanbury & Marshall (1899) indicate two, possibly three, early records for West Kent but none for East Kent. Lousley (1961) lists *Sisymbrium irio* as one of the wool aliens found in East Kent and this listing is probably based on the records of David McClintock from a “shoddy field” near Elmstone and “shoddy sidings” at Birchington and Sandwich, all in 1960. The species was not found between 1st January 1971 and 31st December 1980 during recording for the *Atlas of the Kent flora* (Philp, 1982). It would appear to be no more than a casual in East Kent though present in both survey periods immediately before publication of the two national atlases.

V-c. 17 Surrey

The note by Merrett (1666) that it was “Almost everywhere in the suburbs of London” may have included places in V-c. 17. In any event, it was near Dulwich in 1725 (Brewer, 1863) and again in 1782 (Salmon, 1931), and recorded from “waste ground about Battersea” in about 1827 by Pamplin (Salmon, 1931). Salmon also listed nineteenth century records for Lambeth and Norwood and mentioned that it was a “weed in Kew Gardens” without giving a date. In our survey periods there are two records from near Earlswood in 1957 (Lousley, 1976), one from Roehampton in 1966 (Leslie, 1987) and two from Croydon in 1997 and 1999 (Rodney Burton, pers. comm., 2001).

V-c. 21 Middlesex

As already mentioned the first record for Britain was from this Vice-county in the 1650s. There are many subsequent published records from a dozen locations in Middlesex representing at least twelve decades between 1650 and 1930.

However, Trimen and Dyer (1869) considered the species to be extinct having “seen no specimens collected since 1832, nor ever met with it” themselves; “though, no doubt, it was formerly very abundant,” with the localities they listed being “confirmed by specimens in all the older herbaria collected near London”. De Crespigny (1877) said it was found in “Waste places about London” but he may have been quoting earlier writers and, sadly for his reputation, a specimen collected by him from an “old wall at Croydon” in 1875 and now in **MANCH** looks like *Sisymbrium altissimum*.

Later records from Bloomsbury (near the British Museum in 1914) and the Strand (a few years before 1924) are regarded by Kent (1975) as incorrect. He thought

the Bloomsbury plant was probably *Sisymbrium loeselii*; the Strand plant he stated was *S. altissimum*. Johnson (1924) who recorded *S. irio* on the site of Australia House in the Strand states, “I have seen the London Rocket growing on the town walls of Berwick-on-Tweed where it appears to have lived for ages,” He was right about *Sisymbrium irio* growing on the town walls of Berwick-on-Tweed whence it was recorded by John Ray (Ray, 1690) and several subsequent writers until the early twentieth century, and attested to by herbarium specimens in **BM**, **HAMU** and **MANCH**, for example; he may or may not have been mistaken about the identity of the plant in the Strand.

Fitter (1945) notes how Sir Edward Salisbury failed to find *Sisymbrium irio* when he surveyed the London bombed sites in the early 1940s. Burton (1983) wrote of a century’s absence. While it may not be possible to prove conclusively whether or not *Sisymbrium irio* did occur in Middlesex between 1840 and 1940 there is no doubt about its continuous presence since 1945. It was in 1945 that Mrs Kathleen E. Evetts found the species in or near Trinity Square Gardens near Tower Hill just east of the City of London and provided a specimen for **BM**. It was seen by Lousley in every year from 1947 to 1953 in six locations “all within fifty yards of the Corporation boundary but only one within it” (Fitter and Lousley, 1953). Lousley thought, “The present occurrence is unlikely to be a survival from the earlier ones – it probably found its way to London afresh with some cargo which passed through the docks.”

Also in 1953 it was abundant on a rubbish tip in Greenford on the western side of London (Lousley, 1954). Subsequently there have been published records for Brentford, Regent's Park, Stoke Newington and Kensington, and at least eleven different locations in the London Borough of Tower Hamlets (see **Appendix 1**). Burton (1983) noted that it was "still an abundant weed" in gardens near the Tower of London and that it could "fairly reliably" be found near the Zoological Society's Garden in Regent's Park but after 1986 he received no further records from the latter site (Burton, 1993). Game & Whitfield (1996) mention sightings in the early 1990s in at least ten places in the London Borough of Tower Hamlets. Swindells (2001) reported records for Kensington and several places in Tower Hamlets for the period 1995 to 2001. For further recent, but unpublished records see **Appendix 3**. The evidence is strong enough to support the description "established" in this vice-county.

V-c. 23 Oxfordshire

Killick, *et al.* (1998) note a first record for Oxfordshire from around 1776 and that it was recorded "from 1794 to at least 1906" at Merton College and Oxford Botanic Garden. Sir William Turner Thiselton-Dyer collected it from "Newly-made ground adjoining the Botanical Gardens, Oxford" in 1867 (specimen in **BM**). **SLBI** holds a specimen collected by Prof. Lawson in Oxford Botanic Garden in 1870. **BM** holds a number of other specimens collected in Oxford in various years up to 1909, including one from gravel paths in the Botanic Garden in 1880 by a collector whose name was indecipherable. **MANCH** holds a specimen collected by George Claridge Druce in September 1906 from Oxford –

waste ground on the Iffley Road with an entry from the *Botanical Exchange Club 1906 Report* (1907), p. 211, stuck on the herbarium sheet, which reads,

Doubtless the plant was brought to this place with rubbish from the Botanic Gardens, but it has been a constant in this locality for the last 6 years, and will remain doubtless until the ground is built upon.
G. Claridge Druce.

There are also specimens collected by Druce from “Oxford – waste ground” in 1906 in **BM** and **SLBL**. In 1908 it was found in Marston brickyards and again at Marston in 1936 and there are **BM** specimens for three other years in between. Then there is a gap in the records until it was noticed by J.R. Palmer in a restaurant yard in Becket Street not far from the station from 1981 onwards and from St. Thomas’s Church in the same street by R. Maycock in 1992 and again by Palmer near the former LMS station in 1993 (Killick, *et al.*, 1998). *Sisymbrium irio* could reasonably be considered established for over a century in the City of Oxford but, perhaps for now, a casual, though a recurring one, in the more recent past.

V-c. 30 Bedfordshire

Dony (1953) quoted no records earlier than his own findings, both in 1952, from Biggleswade railway siding and an arable field at Maulden treated with shoddy. Both are vouched for by herbarium specimens in **LTN**. T.C.E. Wells collected a

specimen (now at **ABRN**) from railway sidings at Sundon in 1957. There is a lack of records for the 1960s held by the Vice-county Recorder (Boon, pers. comm, 2005) and at the Biological Records Centre but since then *Sisymbrium irio* has been recorded from Maulden, Flitwick or Flitton in arable fields treated with shoddy in nearly every year from 1970 to 2004. Some of the Bedfordshire records may be considered casual but, at least at Flitwick the species can be reckoned established since 1975, the more notably because treatment of the land with shoddy ceased in 1982 (Hanson, pers. comm., 2006). Here it was seen every year from 1988 to 2004 with numbers as high as c. 1,000 in 2001 and 2002.

V-c. 31 Huntingdonshire

Wells (2003) knew of only four records: from railway sidings at St. Neots and Huntingdon (both in 1950 by J.G. Dony), from Somersham rubbish dump (T.C.E. Wells in 1968) and from the brickwork of the bridge in St. Ives (Lynne Farrell in 1992). It would seem that *Sisymbrium irio* has only ever been a casual in Huntingdonshire: it just happens that three of these four records fall within the date classes being compared.

V-c. 63 South-west Yorkshire

Lees (1888) described *Sisymbrium irio* as “sporadic, but fugitive, and very rare”. He gave one record for V-c. 64 Mid-west Yorkshire and one for V-c. 63. The latter record, in 1869, was of “a few plants at Pontefract, growing on walls near the Castle”. When this record is mentioned in Wilmore (2000) it appears as “foot of castle walls, Pontefract” which is not quite the same.

Wilmore (2000) cites two further nineteenth century records: from Dapper Mill, Wheatley in 1893-94 and maltkilns at Elland in 1894. Then there is a gap in the records of more than half a century until 1958 when *Sisymbrium irio* was found at Jarmaines' Wool waste dump, Kirkheaton by Florence Houseman and L. Magee. Magee also found *S. irio* in Shipley in 1959 and then there is another gap. However, from 1981 the species was found variously as a shoddy field weed in East Ardsley, Newton Hill, Rothwell Haigh and Wrenthorpe in thirteen of the sixteen years to 1996. Lavin & Wilmore (1994) report the observation of John Martin that the plant was locally numerous at one or two sites in the 1980s. No further published records were traced up to 2005 and Geoffrey Wilmore (pers. comm., May 2006) wrote, "I am afraid that, since the demise of the use of wool shoddy as a farm fertiliser in the Ardsley and Wakefield areas about five years ago, I have had no records reported of *Sisymbrium irio*, which used to be a fairly regularly occurring taxon, derived entirely from wool shoddy spread on the crop fields, in the 1980s and 1990s. It used to occur with *Sisymbrium loeselii* and a whole range of exotic species, as you will have noted from *Alien Plants of Yorkshire*". But there were more records to come. As this dissertation was being written up Shimwell (2006) published a further contribution to the study of wool aliens in West Yorkshire, including two additional records of *Sisymbrium irio* from Row Farm, Slaithwaite in the upper Colne Valley in 2003 and 2005 where wool waste is used for winter bedding for cattle in stall.

It seems that *Sisymbrium irio* was a casual in the last decade of the nineteenth century and again in the 1950s. It was persistent, or perhaps more accurately, recurring, in the 1980s and on to 1996 but, apart from one record from gardens, always associated with wool shoddy, prompting Lavin & Wilmore (1994) to describe it as “a regular, if scattered colonist”, so it should not be thought of as established.

V-c. H21 Co. Dublin

In the *Flora of County Dublin*, the Dublin Naturalists' Field Club (1998) provides a very full catalogue of species records, with pre-1904 records copied from Colgan (1904). Colgan gave 1818 as the date of the first certain record for *Sisymbrium irio* in Dublin but, as already cited, thought it probable that an earlier record of Caleb Threlkeld in 1727 “should be referred here”. Dublin Naturalists' Field Club (1998) lists records from at least 38 locations in Co. Dublin during seven decades of the nineteenth century and nine of the twentieth. While some records refer to only a few plants, several show that the species was well established and quite common in certain parts of Dublin in the nineteenth century. Various writers testify to its decline in later years but it persisted through the twentieth century and was still present in at least one location in the City of Dublin in 2006 (see **Appendix 3**).

Investigation of the worldwide distribution of *Sisymbrium irio*

Rich (1991) describes *Sisymbrium irio* as probably native from southern Europe and North Africa to India but introduced widely elsewhere. Dunn (1905) thought that “its

abundance in Afghanistan and parts of Northern India suggests that this region may be its home” though he noted that nowhere within its distributional range were “its habitats given as obviously natural ones”. Tutin, *et al.* (1993) state that it is native in southern Europe and widely naturalized elsewhere, northwards to Sweden and the Baltic States and eastwards to Ukraine and Russia. They include all the major Mediterranean islands from The Balearics to Cyprus in its distribution. In North Africa it is found from the Canaries to Egypt (Townsend & Guest, 1980; Hooker, 1875; and Boulos, 1999). It also occurs in Ethiopia/Eritrea and maybe elsewhere in tropical Africa (Edwards, *et al.*, 2000 and Townsend & Guest, 1980).

In the Middle East and into Asia it occurs in Israel/Palestine, Jordan, Syria, Lebanon, the Arabian Peninsula, Iraq, Iran, the Caucasus, Pakistan, Afghanistan and Turkmenistan (Townsend & Guest, 1980). Zheng-yi & Raven (2001) record it from India, Nepal, Kashmir, Tajikistan and Uzbekistan, as well as Inner Mongolia, Xinjiang and Taiwan.

Rich (1991) notes that *Sisymbrium irio* was introduced to North and South America and Australasia; in 1963 it reached Hawai’i (Stone, *et al.*, 1992). In North America it is “often abundant in southwestern United States and Mexico, sporadic elsewhere, particularly northward” (Rollins, 1993). Forty years earlier, in the north-eastern United States, Gleason (1952) described it as “adventive in Ohio and Michigan and around eastern seaports and *to be expected elsewhere* [this author’s italics]; becoming a weed in the Pacific states”. It has been found in all but one of the provinces of Argentina and also in Chile and Bolivia (Zuloaga & Morrone, 1999). *Sisymbrium irio* is in all the mainland

states of Australia, and in New South Wales occurs in all parts except the Tablelands (Harden, 1990).

Review of habitats of *Sisymbrium irio* from published data

Pearman (2002) lists waste places, pavement cracks, roadsides, banks and walls as places where *Sisymbrium irio* is occasionally naturalised, but he suggests it is more frequently found as a casual, sometimes with grain imports and formerly as a wool alien. The following paragraphs provide detailed examples to substantiate and expand Pearman's list of habitats.

In waste places

Many flora writers give "waste places" as the typical habitat for *Sisymbrium irio* though not many individual published records appear to be from waste places. Salmon (1931) quoted Pamplin's record of c. 1827 from "waste ground about Battersea", and that of Hillard from waste ground near the railway at Holmsley, South Hampshire in 1924 (Brewis, *et al.*, 1996) is another. There are several in Dublin: at Sandymount by the beach in 1902, near Merrion Station in 1903 and at the end of the Point, Ringsend in 1976 (Dublin N.F.C., 1998). However, examination of labels on herbarium sheets in the Natural History Museum (**BM**), Manchester Museum (**MANCH**) and the South London Botanical Institute (**SLBI**) reveals some further examples:

Dublin R.L. Praeger 1903 **BM & SLBI**

Oxford G.C. Druce 1906 **BM, MANCH & SLBI**

Many modern records from urban neglected corners as in Dublin and London could be classed in this habitat category.

If the term “waste ground” is extended to include rubbish tips then several more records may be added from John Ray’s report of the abundance of *Sisymbrium irio* “among the Rubbish in the Ruines” of London after the Great Fire (Ray, 1670) onwards. It was “rare on rubbish tips” at Grandpont in Berkshire in 1890 (Crawley, 2005), on a rubbish tip at Forres in Moray in 1891 (Webster, 1978), and, more recently at Greenford, Middlesex on cinders on a rubbish tip in 1953 (**BM**), on refuse tips near Earlswood, Surrey in 1957 (Lousley, 1976) and on a tip in Elgin, Moray in 1961 (Webster, 1978).

In pavement cracks, on roadsides and banks.

How’s MS note that it “Grows in ye streets near White Chappel” (Gunther, 1922) has already been quoted. Ray (1670) noted it “on mounds of earth between the City [i.e. London] and Kensington”. Trimen & Dyer (1869) included a record from the 1790s from “various places by the roadside between Little Chelsea and Hyde Park Corner” for which William Pamplin had seen a herbarium specimen. It was on a roadside near Eton in 1805 (Druce, 1926), and Colgan (1904) stated that in Dublin, “Its favourite habitat is along unpaved footways at the base of walls”. Several of his records just give the names of streets. The latest *Flora of*

County Dublin (Dublin Naturalists' Field Club, 1998) includes roadside records from a dozen locations in or close to the city.

Among more recent records there is one in 1964 by W.W. Herrington from the Central Street roundabout in Leicester (Primavesi & Evans, 1988). Palmer (1983) reports it as a "weed in the streets" of Hextable, W. Kent; and the one, undated, Shropshire record of E.R. Lloyd is from a roadside near Oswestry (Sinker, *et al.*, 1985). There are several recent roadside records from East London, including: "on a pavement" in Stoke Newington (Wurzell, 1993), "sprouting from the gutter" in Mile End (Game & Whitfield, 1996), "at the base of street trees" on the Isle of Dogs (Swindells, 2001), "in several streets north of Clerkenwell Green" (Mark Spencer in a personal communication, 2006).

On walls.

Clarke (1900) quotes Merrett (1666), "Ubique fere in Suburbiis Lond. Supra muros & juxta fossas" which this author takes to mean, "To be found everywhere in the suburbs of London on walls and next to ditches." Halliday (1997) cites Hodgson's (1898) *Flora of Cumberland* for a record from Cockermouth Castle. Ray (1690) knew it on the town walls of Berwick-on-Tweed and Swan (1993) notes records at various dates from Ray's time to 1919. William Skrimshire collected *Sisymbrium irio* from an old wall in Wisbech in 1779 but though his specimen is gone his herbarium catalogue remains at **WBCH** (Crompton, 2006). Lees (1888) noted that it was 'Rare on old walls at York' before 1850 and in 1869

there were “a few plants at Pontefract, growing at the foot of walls near the castle...” In Chapelizod in Co. Dublin it grew on a cottage roof in 1903 and on the steps of a derelict building in 1986 (Dublin Naturalists’ Field Club, 1998). Most of its current East London locations are on, or at the base of walls, including the wall of the moat of the Tower of London and what is probably its best known current site, on the remains of the Roman city wall near Tower Hill station.

There are other habitats not mentioned by Pearman (2002) but which appear in published accounts. They are covered on p.33 below. After his list of habitats where *Sisymbrium irio* is occasionally naturalised, Pearman turns to the means by which it may have arrived as a casual.

Arriving with grain imports

Salisbury (1961) thought that “the seeds were perhaps introduced with foreign grain”. Rich (1991) says “often associated with grain imports” and Clement & Foster (1994) describe *Sisymbrium irio* as a grain alien. Did the later writers merely restate the view of Salisbury or did they have other evidence? Apart from one record from maltkilns at Ellland (Wilmore, 2000) this author found little evidence in literature to support the view that *Sisymbrium irio* is a grain alien. Records from New Mill, nr Pewsey, Wiltshire in 1874 (Grose, 1957), Wytham Mill, Berkshire in about 1893 (Crawley, 2005) and an undated one from near the mill in Slough (Druce, 1926) may refer to flour mills; that from Dapper Mill near

Wheatley, south-west Yorkshire in 1893 was probably from a textile mill (Wilmore, 2000).

As a wool alien

There is ample evidence to confirm *Sisymbrium irio*'s association with the wool industry with a first record from near Galashiels in Hayward and Druce (1919). Seeds from the tweed mills were carried downstream to germinate on the shingle bars of the Rivers Gala and Tweed. Though Hayward and Druce described and listed 348 alien species, "the outcome of many years observation" *Sisymbrium irio* was recorded by Ida Hayward only once, in 1909. Lousley (1961) notes that Ida Hayward's discoveries after 1919 were negligible. Hayward and Druce themselves noted how "almost the entire source of adventitious plants" had been cut off when the local authority built a new sewage treatment works. Nevertheless, there were at least two further records in the 1960s, one by Mary McCallum Webster in 1964 (now in the herbarium of the Royal Botanic Garden, Edinburgh – **E**) and one by Lousley in 1969 in **BM**.

According to Lousley the Galashiels findings encouraged some Bradford botanists to investigate the plants introduced by their local woollen industry. Their exploration centred mainly on the Frizenhall sewage farm "where the Bradford drains were discharged" but *Sisymbrium irio* does not appear to have been one of the species recorded there. *Sisymbrium irio*, however, was found at a wool waste tip in Middleton (South Lancashire, v.c. 59) in 1960 (Savidge, *et al.*, 1963), and in

Kirkheaton in 1958 and Rothwell Haigh in 1996 (both in South-west Yorkshire, v.c. 63) (Wilmore, 2000).

Apparently wool aliens as agricultural weeds were not recognised as such until John Dony started finding them while recording for his *Flora of Bedfordshire* in the 1940s (Lousley, 1961). Others, notably Christina Goodman (later Dony) in Worcestershire, Lady Anne Brewis and Lousley himself in Hampshire, and Mary McCallum Webster, David McClintock and Florence Houseman elsewhere began to find them too. This time their findings were associated with the use of wool shoddy as a manure or mulch for arable crops, particularly on light soils. Lousley catalogues 25 vice-counties from which records had been collected; *Sisymbrium irio* had been found in eleven of them, namely South Devon, North Hampshire, East Kent, Bedfordshire, Huntingdonshire, Worcestershire, South Lancashire, South-west Yorkshire, Mid-west Yorkshire, North-west Yorkshire and Roxburghshire.

Gordon Hanson (pers. comm., 2006) has described how at first shoddy was brought by rail to Flitwick station in Bedfordshire where it was unloaded by pitchfork thus giving scope for the distribution of seeds before the shoddy even reached the fields. Later shoddy was baled and brought by lorry direct from Yorkshire to be ploughed into the fields. A range of vegetables, including *Brassica* species, beetroot, celery, lettuce and potatoes is grown on a rotational basis in the light soil in this part of Bedfordshire. Priestley's Farm near Flitwick, has been a family farm for generations; there the use of wool shoddy ceased in

1982 but alien species, including *Sisymbrium irio*, continued to appear with numbers recorded each year ranging from four to forty nine species, despite continual use of new herbicides to deal with these weeds.

In the Worcestershire fields treated with wool shoddy vegetables were also grown: notes of carrot, parsnip and bean crops were found on some of the herbarium sheets for wool alien species at Kew (**K**). In an unpublished typescript, Christina M. Dony (née Goodman) described the use of wool waste on the market gardens of the Vale of Evesham (Worcestershire, v.c. 37) and listed the species found (Dony, 1989). She only noted the first record for each species and that for *Sisymbrium irio* is from Charlton in 1953 for which there is a specimen in the herbarium at Luton Museum (**L**). Also at **L** is a specimen collected by John Dony from an arable field at Pinvin in 1954 (Chris Boon, pers. comm., 2005). In West Yorkshire it was vegetable crops and, south of Wakefield, rhubarb that were treated with wool shoddy (Wilmore, 2000). In North Hampshire it was soft fruit that was fertilised with wool shoddy. At Blackmoor Fruit Farm as many as 200 species of alien could be found, among them *Sisymbrium irio* for which Gordon Hanson (pers. comm., 2006) has supplied records for the early 1970s

Other habitats (not mentioned by Pearman)

Associated with demolition, destruction or rebuilding. In several locations sites where demolition or destruction had taken place are recorded as habitats for *Sisymbrium irio*. This group of habitats could be regarded as a sub-set of walls as they often involve rubble and clinker or the remains of walls. It has already been

noted how Ray (1670) reported it from the ruins of London in 1666. Several other writers made similar observations. The numerous rebuilding projects on the town walls of Berwick-on-Tweed from the mid-eighteenth century to the end of the nineteenth century may well have contributed to the success of *Sisymbrium irio* in that location. Works to improve the security of the town following the Jacobite uprising of 1745-46 included re-forming the earthworks, changing the line of the riverside defences and extensive repairs. During that time the projecting battery now known as Fisher's Fort was partially rebuilt (MacIvor, 1972). Thompson (1807) recorded *Sisymbrium irio* "on the Wall between Fisher's-Battery and King's-Mount". In 1816, as part of further extensive works during the Napoleonic Wars, the Ness Gate was built to provide access to the new pier (MacIvor, 1972). A few years later, Johnston (1829) recorded *Sisymbrium irio* "most abundant at the Pier-gate". Twenty four years on Johnston (1853) recorded that "it grows in profusion about the Ness-gate, and there only", though he also drew attention to the way *S. irio* had sprung up in great profusion in 1847 on an embankment by the new railway station. At the latter locality it dwindled to a few plants in 1848 and by 1851 it was gone.

More recently it was "surviving Tramlink upheaval" in East Croydon in 1999 (Rodney Burton, pers. comm., 2001). In East London it has appeared in considerable numbers from time to time during the development of Mile End Park and the redevelopment of Mile End (formerly the East London) Stadium in the 1990s and the first few years of the twenty-first century.

From docks and on ballast hills. There was a good number of records in the early twentieth century from docks, as at Leith in 1903, Falmouth in 1907, Portishead and Cardiff in 1909 and Barry in 1924, and then more recently at Silloth in 1949, Exeter in 1955, Avonmouth (Bristol) in 1958, and Albert Dock, Hull in 2000 as listed in **Appendix 1**. Historically, *Sisymbrium irio* was one of the species occurring on ballast heaps, though not frequently, as at Old Hartlepool (V-c. 66 County Durham) in 1862 and Seacombe (V-c. 58 Cheshire) in 1871. Only in Cardiff was it reported as common (Storrie, 1886). It is possible that the records from by canals as at Brandy Wharf in Lincolnshire in 1948 and Bow Wharf in East London during this investigation were in some way associated with import activity.

Associated with railway lines. The occurrence of *Sisymbrium irio* around railway sidings where shoddy was unloaded has already been referred to but there has been a more general association with railways, as at Langworth station (v-c. 54 North Lincs.) in 1908, between Marazion and Penzance (v-c. 1 West Cornwall) in c. 1925, near Salt Hill, Slough (v-c. 14 Buckinghamshire) before 1926 and several Co. Dublin (v-c. H21) records from 1867 (Sydney Parade) to at least 1987 (Sandymount). In between there were records from Dun Laoghaire in 1893 and several other places, notably “at intervals along the railway” from Merrion to Westland Row in 1903.

Field records and observations

In addition to the data gathered from literature and other sources some field work was undertaken and the resulting records are set out in **Appendix 3**. They are from four London Boroughs and the City of Dublin, some from unpublished locations. In most cases they include numbers of plants seen. At eleven sites visited in 2006 associated species were recorded. **Appendix 3** also includes some “no finds” in places where *Sisymbrium irio* has occurred in the past.

Associated species

There are few mentions in the literature of other species observed growing with *Sisymbrium irio*. Lees (1888) noted that it grew “with *Diplotaxis tenuifolia* and *Cheiranthus* [i.e. *Erysimum*] *cheiri*” at the foot of walls near the Castle at Pontefract in 1869. *Sisymbrium irio* has been included in lists of species found on ballast hills and associated with the woollen industry, especially where wool shoddy was used as a fertiliser. Hanson (pers. comm., 2006) kept records of his observations in nearly every year from 1970 to 2005 in Bedfordshire where the numbers of alien species, including *Sisymbrium irio*, ranged from four to 59 in any one year. Wilmore (pers. comm., 2006) noted that, “It used to occur with *Sisymbrium loeselii* and a whole range of exotic species” in the Ardsley and Wakefield areas of South-west Yorkshire where wool shoddy was used as a farm fertiliser.

It has not been possible to observe *Sisymbrium irio* in a shoddy field location for this study but records of associated species have been made in urban locations in Dublin and

in London. A summary of these records is displayed in **Table 2**. Attempting to key out the sample data from each site using Rodwell's key to the vegetation of open habitats (Rodwell, 2000) did not lead to any recognizable plant community, therefore the conclusion was drawn that *Sisymbrium irio* does not have a place in any semi-natural plant community in Britain and Ireland.

Table 2: Species associated with *Sisymbrium irio* at eleven urban sites in 2006

Associated species	Status	Sites											Sites present	% sites
		1	2	3	4	5	6	7	8	9	10	11		
<i>Poa annua</i>	N	1	1	1		1	1		1	1			7	63.6%
<i>Stellaria media</i>	N	1		1	1	1		1			1		6	54.5%
<i>Conyza sumatrensis</i>	Neo			1	1			1		1	1	1	6	54.5%
<i>Sonchus oleraceus</i>	N		1	1	1					1	1	1	6	54.5%
<i>Taraxacum officinale</i> agg.	N				1	1	1				1		4	36.4%
<i>Veronica arvensis</i>	N			1	1					1	1		4	36.4%
<i>Acer pseudoplatanus</i>	Neo				1			1			1		3	27.3%
<i>Buddleja davidii</i>	Neo				1		1				1		3	27.3%
<i>Capsella bursa-pastoris</i>	A		1	1									2	18.2%
<i>Catapodium rigidum</i>	N					1	1						2	18.2%
<i>Euphorbia peplus</i>	A										1	1	2	18.2%
<i>Geranium pusillum</i>	N				1						1		2	18.2%
<i>Hordeum murinum</i>	A				1						1		2	18.2%
<i>Lactuca serriola</i>	A				1						1		2	18.2%
<i>Senecio squalidus</i>	Neo					1	1						2	18.2%
<i>Senecio vulgaris</i>	N			1				1					2	18.2%
<i>Anisantha sterilis</i>	A				1								1	9.1%
<i>Antirrhinum majus</i>	Neo	1											1	9.1%
<i>Arabidopsis thaliana</i>	N			1									1	9.1%
<i>Atriplex prostrata</i>	N											1	1	9.1%
<i>Ballota nigra</i>	A				1								1	9.1%
<i>Brassica</i> sp.	??						1						1	9.1%
<i>Cardamine hirsuta</i>	N			1									1	9.1%
<i>Centranthus ruber</i>	Neo	1											1	9.1%
<i>Cerastium glomeratum</i>	N		1										1	9.1%
<i>Cirsium arvense</i>	N					1							1	9.1%
<i>Conyza bilbaoana</i>	Neo	1											1	9.1%
<i>Coronopus didymus</i>	Neo		1										1	9.1%
<i>Epilobium</i> sp.	??										1		1	9.1%
<i>Galium aparine</i>	N		1										1	9.1%
<i>Geranium molle</i>	N							1					1	9.1%
<i>Hedera helix</i>	N										1		1	9.1%
<i>Holcus lanatus</i>	N							1					1	9.1%
<i>Lamium purpureum</i>	A		1										1	9.1%
<i>Malva sylvestris</i>	A				1								1	9.1%
<i>Mycelis muralis</i>	N			1									1	9.1%
<i>Oxalis corniculata</i>	Neo			1									1	9.1%
<i>Poa trivialis</i>	N										1		1	9.1%
<i>Polygonum arenastrum</i>	A										1		1	9.1%
<i>Prunus</i> sp.	??										1		1	9.1%
<i>Pseudofumaria lutea</i>	Neo										1		1	9.1%
<i>Rubus fruticosus</i> agg.	N				1								1	9.1%
<i>Sagina procumbens</i>	N				1								1	9.1%
<i>Senecio jacobaea</i>	N	1											1	9.1%
<i>Sisymbrium officinale</i>	A	1											1	9.1%
<i>Sisymbrium orientale</i>	Neo	1											1	9.1%
<i>Solanum nigrum</i>	N or Alien											1	1	9.1%
<i>Sonchus asper</i>	N			1									1	9.1%
<i>Trifolium dubium</i>	N				1								1	9.1%
Number of species	49	8	7	12	16	6	7	5	1	4	17	5		

For key see next page.

Key to Table 2

A = Archaeophyte
 N = Native
 Neo = Neophyte

Sites	Grid ref.	Date
From V-c. H 21: Co. Dublin		
1. Camden Place, Dublin <i>at base of walls in a service road</i>	O1533	28 May 2006
From V-c. 21: Middlesex		
2. St. John-at-Hackney Churchyard <i>in neglected flowerbeds and disturbed ground during refurbishment of churchyard</i>	TQ350852	27 Apr. 2006
3. Streets of Clerkenwell <i>at the base of walls, in pavement cracks and below street trees</i>	TQ3182	11 Jun. 2006
4. Bow Wharf <i>at base of walls and in paving cracks</i>	TQ357832	7 Jun. 2006
5. New Road, Whitechapel <i>at base of wall and in stony cracks in a car park</i>	TQ344816	3 May 2006
6. Vine Court, Whitechapel <i>at base of walls and in pavement cracks</i>	TQ34418165	3 May 2006
7. Nelson Street, Whitechapel <i>waste ground covered in gritty, broken tarmac</i>	TQ347813	3 May 2006
8. Tarling Street, Shadwell <i>at base of wall</i>	TQ349811	3 May 2006
9. Deancross Street, Shadwell <i>at base of a street tree</i>	TQ349811	3 May 2006
10. Upper North Street, Poplar <i>at base of house walls and at edge of pavement</i>	TQ374810	2 Aug. 2006
11. Manchester Road, Isle of Dogs <i>at the meeting of a paved area and close-boarded fence</i>	TQ384784	10 Aug. 2006

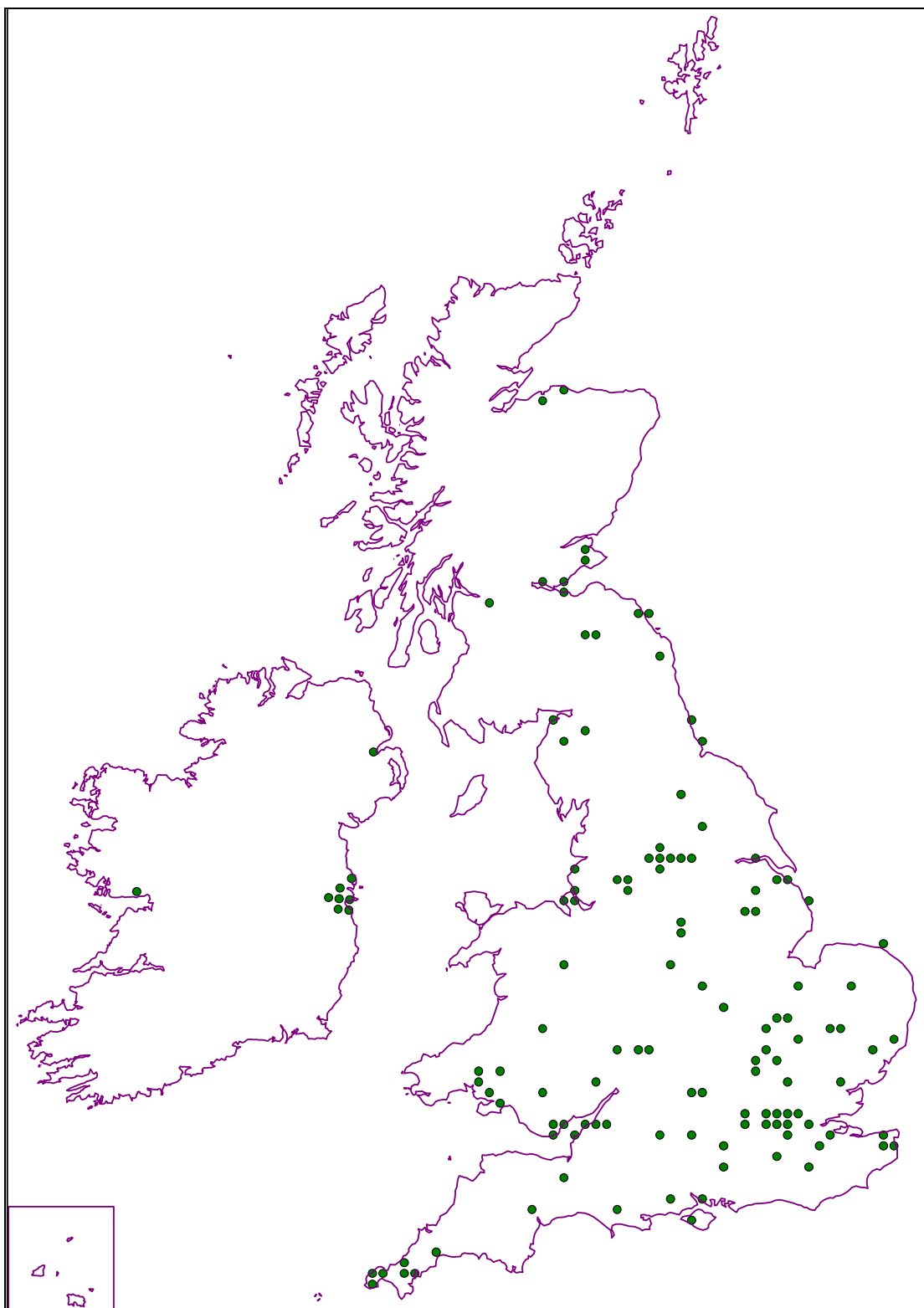


Figure 11: Distribution of *Sisymbrium irio* in Britain and Ireland, all squares 1651-2000

Discussion

Changes in distribution pattern and fluctuation in numbers

What is clear from this study is that in Britain and Ireland *Sisymbrium irio* is a plant of fluctuating fortunes in range and numbers. Over the 350 years from its first discovery there was a marked increase in the number of locations in which it was found, levelling off in the twentieth century. From its earliest finding in Britain it has been a plant of the streets. Horwood and Noel (1933) give it the rather grander epithet, “viatical”. Marren (1999) calls it “the original urban wild flower” but, as this study shows, it has also occurred in a variety of other habitats.

In the second half of the nineteenth century it was to be found in a number of places on ballast hills but as the use of ballast declined and the hills became overgrown, were landscaped or built on that habitat was lost. In the early twentieth century the association of alien species with wool waste or shoddy became apparent, primarily through the work of Ida Hayward near Galashiels (V-c. 80 Roxburghshire) (Hayward & Druce, 1919).

Though Hayward only recorded *Sisymbrium irio* once in 1909 there were further records by Lousley and Webster in the 1960s from the Galashiels area. From 1950 *Sisymbrium irio* was one of the species associated with the use of wool shoddy as a fertiliser, particularly on market garden crops. Its distribution, initially via the railways accounts for the number of records from railway sidings as well as in the fields themselves. Wool shoddy was still being used on the Yorkshire rhubarb crop as recently as 2004 (Herbert, 2004) but according to Wilmore (pers. comm., 2006) has not been seen in its V-c. 63 South-West Yorkshire sites since about 2000. At Blackmoor Fruit Farm (V-c. 12 North Hampshire) it was not seen after the 1970s (Hanson, pers. comm., 2006). In contrast, it

was still found on Priestley's Farm, Flitwick (V-c. 30 Bedfordshire) in 21 of the years after 1982 when shoddy use ceased. Despite its continuing success at the last site it seems unlikely that the use of wool shoddy will account for many more records in the near future.

Palmer (1983) speculated whether *Sisymbrium irio*'s appearance as a street weed in Hextable (V-c. 16 West Kent) in 1983 owed its origin to the use of shoddy on nearby fields during 1948-1950. Similarly W. Thompson (pers. comm., 2005) wondered whether its appearance in a car park in Evesham (V-c. 37 Worcestershire) in 2000 might have been connected with the use of shoddy in nearby market gardens in the 1950s. It is in car parks, streets and waste places where it appears currently to be most successful: in inner London, Taunton, Evesham, Oxford and still lingering in Dublin (see records in **Appendix 1** and **Appendix 3**).

There appears to be no place where *Sisymbrium irio* has been found continuously since its first discovery until the present day as the bar chart at Appendix 2 shows; the published records and herbarium data do not provide the evidence to claim this. On the other hand, it has clearly survived for long periods in a few places: notably in London close to the City, in Oxford, in Berwick on Tweed, and in Dublin. **Table 2** lists the seven 10 Km squares in which *Sisymbrium irio* has been recorded in three or more date classes.

Table 2: 10 Km squares with the longest occupancy by *Sisymbrium irio*

10 Km square	Locations	No. of Date classes
TQ38	The City & East London (V-c. 21: Middlesex)	6
O13	Dublin (V-c. H21: Co. Dublin)	5
SP50	Oxford (V-c. 23: Oxfordshire)	5
TQ37	Nr. Blackheath (V-c. 16: West Kent) Dulwich & Lambeth (V-c. 17: Surrey) Isle of Dogs (V-c. 21: Middlesex)	5
NU05	Berwick upon Tweed (V-c. 68: Cheviot)	4
TQ27	Battersea (V-c. 17: Surrey) Kensington & Chelsea (V-c. 21: Middlesex)	4
O14	Swords (V-c. H21: Co. Dublin)	3

If the statement “waste places about London” of De Crespigny (1877) could be relied upon then it would provide a record for the second half of the nineteenth century for TQ37 or TQ38, or both; then there might be one 10 Km square in which *Sisymbrium irio* was found in all seven date classes. However, in the light of the 1869 comment of Trimen & Dyer that they had not seen a specimen collected during the previous 37 years and the finding by this author of a doubtfully identified specimen from De Crespigny’s herbarium (of which more below) it seems unwise to regard his statement as anything more than a generalisation copied from earlier writers. There must be a similar question about the record in Ray (1724), not about Ray’s competence as a botanist but arising from the fact that this was the third edition of his *Synopsis methodica Stirpium Britannicarum...* and published nineteen years after his death. The third edition was

prepared by J.J. Dillenius and worked on assiduously by him according to Stearn (1973) but apart from the addition of page numbers to the references there is no difference in the entry for *Sisymbrium irio* from that of the 1690 edition. Was it still present at Berwick upon Tweed? This author has assumed it was not when compiling the table in **Appendix 1**.

There are gaps in the records, so was *Sisymbrium irio* still present but unrecorded? In London it was first observed in Whitechapel before 1656 *and* it was present in Whitechapel in 2006 no more than a quarter of a mile from where it was first seen. One could imagine that botanists in the nineteenth century might shrink from investigating the streets and alleyways of London's East End which could have a bearing on the lack of records.

Is it a species which requires continuous re-introduction? Certainly Lousley (Fitter & Lousley, 1953) thought that its presence just east of the City of London from 1945 was “unlikely to be a survivor from the earlier ones – it probably found its way to London afresh with some cargo which passed through the docks”. Alternatively, were its seeds dormant awaiting the right conditions for germination? When conditions are right it can appear in profusion as a number of the historical records in **Appendix 1** show but within a year or two its numbers can dwindle to single figures. The field records in **Appendix 3** give some current examples where numbers have fluctuated.

Is *Sisymbrium irio* a native or an alien?

Webb (1985) proposed eight criteria that may be deployed to distinguish alien from native species in Britain and Ireland. In the following paragraphs *Sisymbrium irio* will be assessed in relation to those criteria. Webb made it clear that while not all of the criteria would be applicable to every species and only very occasionally would a single criterion be decisive, “when several point in the same direction one is justified in accepting the composite evidence as reasonably conclusive”.

Fossil evidence

It was Webb’s view that “a fossil record attributable to a date between the last glaciation and the beginning of Neolithic agriculture provides evidence of native status which can be regarded as conclusive. Absence of fossils from this period and plentiful representation at earlier or later dates suggests alien status but cannot prove it.” Webb refers to the evidence presented in Godwin (1975) but urges caution with regard to the list of weeds and ruderals. However, in the case of *Sisymbrium irio* Godwin presents no fossil evidence. Alien status is therefore suggested but it should be noted that no other literature source has been searched for this criterion.

Historical evidence

The discovery of *Sisymbrium irio* in the 1650s or earlier pre-dates the first records in Britain of many accepted native species but does not in itself contribute evidence of its native status.

Webb proposed “that absence from an early list or Flora of a conspicuous plant of doubtful status” points to its being an alien. He cited *Muscari neglectum* as an

example: in Cambridgeshire it was unknown to Ray in the seventeenth century but recorded by Henslow in 1828. Dunn (1905), writing of *Sisymbrium irio* eighty years before Webb ventured this proposition, notes how “both Merrett and Ray expressly state that it was common in the suburbs of London during the years preceding 1667” and goes on to suggest that it was then a recent introduction because “Parkinson, writing in 1640, did not know it as an English plant”.

Webb regards rate of increase or decline, as a particular kind of historical evidence which when very noticeable “provides some presumptive evidence for alien status”. He goes on to cite some examples, including *Sisymbrium irio*; thus, “native plants do not, as a rule, behave like *Elodea canadensis* or *Veronica persica* in their spread, or like *Sisymbrium irio* or *Agrostemma githago* in their decline”. He admits that there are exceptions but considers they are few “and the rule is of considerable value”. One wonders what Webb’s evidence was for the decline of *Sisymbrium irio*. Being based in Dublin he was doubtless aware of the observation of Colgan (1904) “that it has become quite rare”. He may well have recorded its further decline from his own observations, and in the very year that his paper was accepted for publication in *Watsonia* Jackson and Skeffington (1984) wrote in their *Flora of inner Dublin* of “its dramatic decline” and reported that *Sisymbrium irio* “is apparently absent from the inner city and is probably extinct in Dublin”. However, within a year (i.e. in 1985) it was “still at Loughshinny, in the harbour”; it was “still in Chapelizod village...” [near Phoenix Park] in 1986; and “still at Sandymount” in 1987 (Dublin Naturalists’ Field Club, 1998). There were also “several plants in Camden Place off Harcourt Street” in

the inner city in 1992 (Dublin Naturalists' Field Club, 1998). It was not extinct though it does appear to have been a lot less common than in the nineteenth century.

Looking at the picture for the British Isles as a whole, there was a dramatic increase overall in the number of records for *Sisymbrium irio* from the end of the eighteenth century to the middle of the twentieth century as **Figure 1** demonstrates. However, at a more local level it seems to fluctuate in numbers, disappear and re-appear somewhere else.

Habitat

On habitat Webb stated that “if a plant grows only in man-made habitats it is likely to be an alien; if it grows in natural habitats it is likely to be native”. He acknowledged that some species may grow in both kinds of habitat but thought that “on the whole... it seems fairly safe to regard as alien those species which are very seldom seen except as field or garden weeds”. He thought the criterion “gives less certain guidance for ruderals”. As already described, many of the early records of *Sisymbrium irio* were from walls; no records could be found from natural equivalents such as rock outcrops, or sea or river cliffs. All the other habitats recorded for *Sisymbrium irio* in Britain and Ireland are artificial: waste ground, gutters, pavement cracks, docks, railway lines and sidings, refuse tips of various kinds, around fruit trees and among vegetable crops. This points to the likelihood that *Sisymbrium irio* is an alien. Dunn (1905) has already been cited for his similar observation about *Sisymbrium irio* throughout its range worldwide.

Geographical distribution

Webb suggested that though geographical distribution can never be a decisive criterion “it can give a strong hint”. He discussed the significance of continuous and disjunct distributions. Examination of **Figure 11** shows a disjunct and scattered distribution for *Sisymbrium irio* in Britain and Ireland with no obvious geographical pattern or link with climate or geology. The worldwide distribution was reviewed on p. 25 above and shows a species spreading effectively throughout the warmer temperate regions and from there into cooler parts of the world. All these factors point to its alien status.

Frequency of known naturalisation

“If a plant claimed to be native in one locality is becoming more and more widely naturalised in similar habitats not far away then some reconsideration is called for” (Webb, 1985). This arguably happened with *Sisymbrium irio* in Dublin in the nineteenth century and the appearance of the species in many new locations in the London area in recent years could be seen to cast doubt on native status.

Genetic diversity

“It seems reasonable to suppose that if the weed populations of a species show obvious genetic differences from small populations found in natural habitats it is more likely to be native than if the two populations are more or less identical.”

After discussing a possible example Webb goes on to state that “unfortunately

there are very few species for which the relevant data are available”.

Investigation of genetic diversity is outside the scope of this study.

Reproductive pattern

The nub of Webb’s argument for this criterion is that “if a plant reproduces entirely vegetatively it can legitimately be suspected of being an alien”. This is not applicable to *Sisymbrium irio* which reproduces by seed.

Possible means of introduction

The argument behind Webb’s eighth criterion is that “if a species is to be confidently classed as an alien it is obviously desirable that one should have some idea of how it came to be introduced. If no such mechanism can be suggested it is an argument in favour of native status...” He goes on to say that the various arguments must be weighed and the least improbable conclusion adopted. The appearance of *Sisymbrium irio* as a weed in fields treated with wool shoddy would seem to indicate quite clearly the means of arrival of the plant in those locations.

There is circumstantial evidence of its being an alien when it appears in docks and harbours, on ballast hills and by railways (and especially railway sidings). Many of the town locations for the species are also ports: Newlyn, Par, Exeter, Bristol, Hull, Berwick-upon-Tweed, Silloth, Leith, Cardiff, Dublin and London.

Historically, Dublin and London were the largest ports in their respective countries. Is it significant that the most successful populations of *Sisymbrium irio* were (and still are), in those two cities?

The balance of evidence from the application of Webb's criteria is that *Sisymbrium irio* is an alien species. No evidence has been found to suggest that it arrived in Britain earlier than the seventeenth century and in Ireland before the eighteenth century so it is a neophyte as defined by Preston, *et al.* (2002).

The problem of inaccurate identification

The gathering of data for this study was made more complicated by the number of specimens in herbaria that were found to be incorrectly identified and it begs the question of how many specimens there may be in other herbaria incorrectly identified as *Sisymbrium irio*. It was partly based on this experience that BRC records lacking the name of a recorder were excluded from the table of records in **Appendix 1** unless they appeared to confirm records in the literature; not that the literature is without doubtful records – usually pointed out by a later writer..

Examples of mistaken identification were found on herbarium sheets in Manchester, Liverpool, Stoke on Trent and the South London Botanical Institute. Only in the Natural History Museum in London did all sheets of *Sisymbrium irio* appear to be correctly labelled. Out of the 81 specimens of “*Sisymbrium irio*” from the Herbarium of the University of Manchester Museum nine were incorrectly identified and a tenth was doubtful. The species identified as *Sisymbrium irio* included *Sisymbrium loeselii* and *S. altissimum*, a species of *Barbarea*, and a *Rorippa* (*R. amphibia*?) described on the label as from “banks of the Severn... stream sides” which should have given the finder a clue. Of ten specimens examined at the South London Botanical Institute two were doubtfully correct: one from Par Harbour, Cornwall collected by FHD on 7 June 1902 looked like

Sisymbrium loeselii and one from Leith Docks, near Edinburgh collected by I. Fraser on 27 July 1907 looked like *S. orientale*.

A doubtful example of *Sisymbrium irio* from Liverpool Museum, drawn to the author's attention by Martin Godfrey (personal communication, 2003), turned out to be *S. orientale*. This specimen had been collected in Great Tower Street, the only place in the City of London, from which *S. irio* was recorded after the blitz and is an example of the confusion between *Sisymbrium irio* and other species in the genus that Fitter & Lousley (1953) report. Godfrey (in another personal communication, 2004) also supplied a copy of a specimen in the City Museum, Stoke on Trent for confirmation. This had been collected by E.S. Eedes in 1944 from a roadside at Ashley, between Blackbrook and Weymouth, Staffordshire and labelled simply "*Sisymbrium*". A subsequent label placed by F. Rilstone reads:

<p>"<i>Sisymbrium Irio</i> Linn. My first impression that it was <i>S. Columnae</i> [i.e. <i>Sisymbrium orientale</i>] was wrong."</p>
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Actually, his first impression was right; the plant was *Sisymbrium orientale*.

Misidentification by earlier observers is often noted in the literature; examples from Wiltshire and Surrey follow. Grose (1957) stated that a Wiltshire record of Preston "can be accepted; other records are more or less suspect". He went on to cite six of these suspect records and to quote earlier writers casting doubt on their accuracy. A particularly worrying example is from the "sides of rivulets, near Upper Charlton Farm" recorded by W.G. Maton in 1843. Grose quotes Smith's 1845 comment that "I was

unsuccessful in finding it there but saw a few plants of *Barbarea vulgaris*. As the Dr. [William George Maton] did not altogether confine himself to his own observations, I am inclined to think his informant must have taken the latter for *Sisymbrium Irio*.” Grose noted that Flower and Preston, two earlier writers on the flora of Wiltshire also cast doubt on this record. Salmon (1931) saw a specimen in **BM** that was labelled *Sisymbrium irio* but was in fact *Diploaxis tenuifolia*. It is no longer in the file for *Sisymbrium irio*.

For botanists in the early 1950s identification was made confusing by the transposition of the leaves of *Sisymbrium irio* and *S. orientale* in Fig. 23 of the first edition of Clapham, Tutin and Warburg (1952) reported by Bangerter and Welch (1952)!

Areas for further study

Some of the herbarium findings suggest that a look at the holdings of other herbaria would be worthwhile to check specimens from Cornwall and Midlothian, for example. There is scope for further investigation of the discrepancies between the atlases, e.g. why there are hardly any Welsh records in the *New atlas* when there are several in Perring & Walters (1962) and in Ellis (1983). More work could be done on associated species and to investigate the links between the success of *Sisymbrium irio* and evidence of climate change.

What is the future for *Sisymbrium irio*?

Currently *Sisymbrium irio* is surviving best in urban locations but urban locations are notoriously precarious for plants which have to find cracks in paving and walls and “the dirt that collects in any odd corner” (Ingrouille, 1995). “They face physical disturbance,

pollution and the difficulty of colonizing sites isolated by the desert of concrete, brick and tarmac” (Ingrouille, 1995). They also face hotter summers and milder winters.

Bevan (2001) wrote in *The London Biodiversity Action Plan* of the “heat island effect” whereby built-up inner London experiences higher temperatures than outer London and which “brings the urban climate closer to the Mediterranean, allowing such plants as London Rocket... and many other warmth-demanding species to thrive”. Burton (1983) has suggested that its “seed production is assisted by the city’s summer heat” and this could account for its recent spread in inner London. Burton claimed that he did not know “if it was in a period of warmer climate that it became established in a much smaller London” after the Great Fire. It probably was as the Booty Meteorological Information Source website (2006) reports hot summers in 1666, 1667 and 1669. One effect of the recent warmer summers and milder winters observed by this author has been the earlier flowering of *Sisymbrium irio*. In East London its main flowering period is mid April to mid June, rather than June to August as stated by Clapham, Tutin and Moore (1987).

In London *Sisymbrium irio* has been identified as a plant of cultural interest and one of those species which “provide a truly international dimension to the Capital’s flora and paint a vivid picture of the mixed cultural heritage of our city” (Bevan, 2001). In Tower Hamlets it is the subject of a Species Action Plan (Swindells, 2004) within the London Borough’s Local Biodiversity Action Plan. Threats to its survival were identified as “over-zealous tidying” and “the weedkilling of pavement edges”. These activities were observed in the London Borough of Tower Hamlets and the London Borough of Islington during the gathering of field records for this study. In Dublin, Colgan (1904) attributed

Sisymbrium irio 's decline a century ago to “the general introduction of concreted foot pavements”. On a visit in 1995 this author observed the liberal use of weedkiller on some of that city's pavements.

These threats apart, it seems likely that *Sisymbrium irio* is set to thrive in inner city locations and this decade could be the beginning of a new period of increase in numbers and range of the species.

Conclusions

Sisymbrium irio is a rare plant in Britain and Ireland. Its range and population size have fluctuated considerably since its discovery in about 1650. Any former claim to be native cannot be justified: it is a neophyte occurring persistently in a very limited number of locations and as a casual in almost all its other known locations in Britain and Ireland. It does not appear to be a member of a recognised community within the National Vegetation Classification. Recent warmer summers and milder winters may account for the earlier flowering observed in London. It is currently most successful in waste places in towns, as a street weed and on walls. In many parts of the world it is regarded as a weed and with further warmer summers and milder winters could increase in Britain and Ireland as it has in parts of the U.S.A.

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Appendix 1: Records of *Sisymbrium irio* in Britain and Ireland by vice-county

This table is compiled primarily from published records in the principal county and regional floras of Britain and Ireland and from examination of specimens in the herbaria of the Natural History Museum, Manchester Museum and the South London Botanical Institute. That information has been supplemented by records drawn from the websites of the herbaria of the University of Hull, the University of Bristol and others, correspondence with selected BSBI Vice-county Recorders and personal communications. In addition there is a limited number of records from the Biological Records Centre but these have only been used when they include full details of recorder, place and date or if they appear to confirm incomplete data drawn from a published source. There is a key to the abbreviations used for herbaria and a short list of other abbreviations at the end of the table.

OS Grid Ref	Location 1	Location 2	Notes/comment	Date(s)	Recorder etc.	Information
	England					
	1a Scilly			-		Not in Lous Not in Knigh
	1 W. Cornwall					
SW42	Newlyn		Garden ground	1868	Wm tes Dra	Davey (190
SW43	Penzance	Eastern Green		c. 1888	W./ Gla Per Na Rep	Davey (190
SW73	Ponsanooth			1903		Davey (190
SW74	Bissoe			1906- 1908		
SW83	Falmouth	Docks		1907		Davey (190
SW43	Marazion	Railway between M. & Penzance		c. 1925	E.A Thu Vig	Margetts & (1981)
SW53	Lelant	Nr. The ferry		c. 1925	E.A Thu Vig	Margetts & (1981)
SW53	Copperhouse		[nr. Hayle]	c. 1926	E.A Thu Vig	Margetts & (1981)
	2 E. Cornwall					
SX05	Par			1902- 07		Davey (190
	3 S. Devon					
SX99	Exeter	Docks		1955	R.C	BM
	4 N. Devon			-		Not in VcCC
	5/6 Somerset			Pre 1835	Gap Ne bot gu	?
	5 S. Somerset					
ST22	Taunton	Around Wood Street Car Park	& occasionally elsewhere nearby ST22H	1976 to 1996	R.C Sim	Green <i>et al.</i>
	6 N. Somerset					
ST47	Portishead	Dock		1909	Mis Rop	Roe (1981)
ST57	Bedminster, Bristol		ST5771	1922	Mrs [I.] & N.Y Sar BR	Roe (1981)
ST57	Bedminster, Bristol		ST5771	1930	Mrs	Roe (1981)

					Sar N.Y Sar BR	
ST36	Weston-super-Mare			1931	C. V HLI	
	7 N. Wiltshire			-		<u>Not in VcCC</u>
	8 S. Wiltshire					
SU16	New Mill	Nr. Pewsey	SU183619	1874	T.A DZ Reg Ma Col	Grose (195
	9 Dorset					
SY79	Hurst	Nr. bridge during rebuilding	Casual, recorded pictorially [counted as 1851-1900]	1800s	M. I	Bowen (200
	10 Isle of Wight					
SZ48	Newport	On site of old wall	Wall pulled down in 1874. Not seen since. {Assumed to be in 1851-1900 date class}}	?	Str (19 Mor F.(1 Also Lon (19	Bevis, et al.
	11 S. Hampshire					
SU20?	Shoot	Gravel-pit		1919	Mis Hill Pro N.H 233	Brewis, et a
SU20	Holmsley	Near railway	Waste ground	1924	Mrs Rot Pro N.H 233	Brewis, et a
SU50	Fareham	Wall of Mr Robinson's garden		1943	W.L	MANCH
	12 N. Hampshire					
SU75	Odiham		Garden weed	1902	E.F BM	Brewis, et a
SU73	Blackmoor	Blackmoor Fruit Farm	Shoddy used as manure/mulch	1970 & 1971	C.G	C.G. Hanso (pers. comr
SU73	Blackmoor	Blackmoor Fruit Farm	Shoddy used as manure/mulch	1973 & 1974	C.G	C.G. Hanso (pers. comr
	13 W. Sussex			-		<u>Not in VcCC</u>
	14 E. Sussex			-		<u>Not in VcCC</u>
	15 E. Kent					
TR25	Elmstone		Shoddy field	1960	Dav Mc	NCC files
TR26	Birchington	Railway siding	Shoddy	1960	Dav Mc	NCC files
TR35	Sandwich	Railway siding		1960	Dav Mc MN	NCC files
	16 W. Kent					
TQ37	Nr. Blackheath		"In the land going to Blackheath a little beyond the stile that goes to Charlton the upper way."	c. 1700	Doc	Hanbury & I (1899)
TQ76	Frindsbury		[assumed to be 1851-1900]	n.d.	Mis	Hanbury & I (1899)
TQ53	Tunbridge Wells			1912	E.C	BM
TQ65	Nr. Watlingbury		Wool alien in a hop garden	1971 (BRC)		Philp (1982
TQ37	Deptford	Corner of Edward St. and Amersham Vale	Vacant building site	1975	Roc Bur	Burton (198 NCC files
TQ57	Hextable		Weed in the streets (ex shoddy use in 1948-50?? Not recorded at the time.)	1983	Joh Pal	Palmer (198
TQ57	Hextable		Still there	1990	Joh	Burton (199

					Pal	
	17 Surrey					
TQ37	Nr. Dulwich	Between London and Dulwich		1725	Mr. Har Ma (17 Bot	Brewer (186 Salmon (19 Lousley (19
TQ37	Nr Dulwich			1782	J.A Hb (see C.E	Salmon (19
TQ37	Lambeth	Church-yard		c. 1836	J.L. Flo (18	Brewer (186 Salmon (19
TQ37	Norwood			c. 1836	Fl. (18	Salmon (19
TQ27	Battersea Fields			c. 1836	Flo (18	Brewer (186 Salmon (19
TQ27	Battersea	Waste ground about		1827?	Par (18	Salmon (19
TQ17	Kew	Royal Botanic Gdns	Weed in Kew Gardens	?	Brit	Salmon (19
TQ24	Nr. Earlswood	Refuse tip		1957	Mis Mo	Lousley (19
TQ24	Nr. Earlswood	Another refuse tip		1957	Lou	Lousley (19
TQ27	Roehampton			1966	R. f Jac	Leslie (1987
TQ36	Croydon	Dingwall Rd, East Croydon	In raised bed	1997	J.C	Rodney Bur comm., 2001)
TQ36	Croydon	Corner of Dingwall Rd and George St, East Croydon	Surviving Tramlink upheaval	1999	J.C	Rodney Bur comm., 2001)
	18 S. Essex					
TQ48	Barking			1822	Mr.	BM Not in V
TQ48	Barking	Barking Tip		1973	C.C	BRC
	19 N. Essex					
TL81	Faulkbourne	Faulkbourne Hall		c. 1677[?]	Ray	Ray (1690) subsequent Essex autho
	20 Hertfordshire			1849	We Col (18	Dony (1967
TL31	Hertford	Nr. the gasworks		c. 1877	?	De Crespigi
TL31	Ware			1917	A.V Gra Hb.	Dony (1967
TL23	Letchworth			1929	Dyr	Dony (1967
	21 Middlesex					
TQ38	Nr. Whitechapel		"Grows in ye streets near Whitechappell east from Aldgate, London. J. Goodyer."	<1656	Joh Goo	MS note by in his Own copy of <i>Phytologia Britannica...</i> 1650). Günther (1922), etc.
TQ38	King's Cross [then known as Battle Bridge]	By the "Pindar of Wakefield"	"In no great quantity"	< 1666	Tho Mor (16	Kent (1975)
TQ38, etc.	London	[Almost?] everywhere in the suburbs	On walls and next to ditches	c. 1666	Mei (16	Trimen & D Clarke (190
TQ38	London	City	On walls, etc. after the Great Fire, esp. around the ruins of St. Paul's Cathedral.	1666 & 1667	Joh Mor (16 219 also	Ray (1670) Trimen & D (1869), etc.

					<i>Pra</i> 498	
TQ27 TQ37 TQ38	London	Between the City & Kensington	On mounds of earth	c. 1670	Joh	Ray (1670) Fitter (1945)
TQ27	Chelsea		Copiously about Chelsea	1670s?	Mo (16 219 als <i>Pra</i> 498	Trimen & D (1869), <u>etc.</u>
TQ27	Kensington			c. 1675	Law Law	Kent (1975)
TQ27	Chelsea		Plentifully on the Lord Cheney's wall at C.	c. 1695	Jan Pet Pet (16	Trimen & D
TQ38	Islington/Spitalfields	Between Brick Lane and Islington	[Could be Shoreditch or Hoxton]	c. 1709	Jan Pet Pet (17	Trimen & D
TQ38	Nr. Islington		[Same as above?]	?	?? Lor	Kent (1975)
TQ38	London	Goswell Street	At the end of	c. 1760	Joh Hill 338	Trimen & D
TQ38 etc.	London		Frequent enough about London	c. 1777	Will Cur	Curtis (1777) Trimen & D
TQ27	Little Chelsea to Hyde Park Corner		"Mr Haworth told me that when he first came to live at Chelsea, about 1790-95, it used to grow in great abundance in various places by the roadside between LC and HPC."	1790- 1795	Mr. Hb. Spe see Par T&I Wa (18 p. 9	Trimen & D Kent (1975)
TQ38	Shoreditch	Opposite Shoreditch Workhouse		c. 1805	L.W Tur Dilh (18	Trimen & D
TQ38	Shoreditch	Opposite Shoreditch Workhouse	[Same as above?]	n.d.	Jan l'Ar	BM (ex C.E Salmon's h
	??			1807	D. T	Kent (1975)
TQ27	Chelsea	In Chelsea Garden and all that neighbourhood	A troublesome weed	Pre- 1814	Sm 181	Trimen & D
TQ27	Brompton			?	Mr. MA Tur Dilh (18	Trimen & D
TQ38	Haggerston		About Haggerstone	[pre 1849]	E. F BM Tur Dilh (18	Trimen & D Kent (1975)
TQ27	Chelsea		Near Chelsea [= New Chelsea in Kent (1975)?]	?	E. F [Ke note Tur Dilh (18	Trimen & D
TQ27	Earl's Court	To the new church near Walham Green	Growing beneath brick walls at the side of a then new road which passes the northern boundary of the cemetery, not very plentifully.	1832		Trimen & D

			"On walls and dry waste ground; very rare." "We have seen no specimen collected since 1832, nor ever met with it ourselves... formerly very abundant..."			Trimen & D
TQ27	Fulham	Nr. Walham Green	[Is this record the same as the one below?]	c. 1838	Wm	Irvine (1838)
TQ27	Nr. Fulham	Walham Green	[c.f. above]	n.d.	Wm	BM (Kent, 1
TQ27	Nr. Fulham	Walham Green	[c.f. above]	n.d.		MANCH
TQ38	Hornsey			c. 1840	Bal	Kent (1975)
TQ18	Hanwell			1846	Ex Mcl in t CG	NCC files
???	London	Waste places about	[Quoting earlier authors?]	<1877	?	De Crespig
	Bloomsbury	Waste site near British Museum	[Record queried by Kent (1975) who thinks Shenstone saw <i>S. loeselii</i>]	1912	She She (19	Fitter (1945 Kent (1975)
TQ38	Westminster	Strand/Aldwych	[Record queried by Kent (1975) who says Johnson saw <i>S. altissimum</i> . but Johnson had "seen the London rocket growing on the town walls of Berwick-on-Tweed".]	c. 1924	Wa Joh	Johnson (19 Kent (1975)
TQ38	Nr. Tower of London	Trinity Square Gardens	Kent (1975) says "Trinity Gardens, E.C."	1945	Mrs E. E BM	Kent (1975)
TQ38	Nr. Tower of London	Trinity Square Gardens	Spreading	1952	J.E	Lousley (19 Kent (1975)
TQ38	Nr. Tower of London	Churchyard of All Hallows, Barking [= All Hallows-by-the-Tower]	"It was... with considerable regret that we heard that seeds had been sown deliberately in the churchyard of All Hallows, Barking..."	c. 1953		Lousley (19
TQ38	City of London	Great Tower Street, E.C.	Bombed site	1953	A.W BM	Lousley (19 Kent (1975)
TQ38	City of London	Just inside the E. boundary of the City	[probably the record of Jones above]	1947- 1953	J.E	Fitter & Lou (1953)
TQ38	Nr. Tower of London	Within 50 yards of the Corporation's boundary	In five locations	1947- 1953	J.E (19- spe BM	Fitter & Lou (1953)
TQ18	Greenford	Rubbish tip	"In quantity" (Lousley, 1954)	1953	Bar We	Lousley (19 Kent (1975)
TQ18	Greenford	Rubbish tip	Label reads] "rubbish tip on cinders"	1953	Bar We	BM
TQ18	Greenford	Rubbish tip		1954	D.H	BM
TQ38	Nr. Tower of London	Trinity Square, E.C.3	[A misprint for the 1945 record?]	1954	Mrs	Kent (1960)
TQ28	Regent's Park	In a hedge bordering the Zoological Gardens	Label reads "roadside near"	1956	H.C (col Bar Mrs We	Lousley (19 Kent (1975)
TQ38	Tower of London	Gardens	"and elsewhere"	1959	J.E	Kent (1960)
TQ28	Regent's Park	London Zoo		1965	I.G.	Kent (1960)
TQ28	Regent's Park	Zoological Gardens	Near the Snake Pit	1966	M.E Ker (col Ker	Kent (1967) Kent (1975)
TQ38	Nr. Tower of London	Trinity Square Gardens	Plentiful	1966	?	Kent (1975)
TQ38	Tower of London	Gardens of	Abundant and increasing	1967	J.E	Kent (1975)
TQ28	Regent's Park	At the side of the Outer Circle behind the	Still present	1968	??	Kent (1975)

		Zoological Gardens				
TQ17	Brentford	Carville Hall Park South	8 plants	1973		Kent (1975)
TQ17	Brentford		4 plants	1974		Kent (2000)
TQ38	Nr. Tower of London	Trinity Square Gardens	"Still an abundant weed."	1983		Burton (1983)
TQ28	Regent's Park	In and around the Zoo		1983		Burton (1983)
TQ38	Mile End Park	Nr. Woodison Street	Abundant weed in flowerbeds.	1983	J.N	NCC files
TQ28	Regent's Park		[In 1993 Burton reported that he had received no records of <i>S. irio</i> from here since 1986.]	1986		Kent (2000) Burton (1993)
TQ38	Tower of London			1986	T.C	BRC
TQ38	Nr. Tower of London	Old London wall		1988	T.C	BRC
TQ38	Poplar	Nr. new Billingsgate Market		1988	T.C	BRC
TQ37	Isle of Dogs			1991	J.M	Kent (2000)
TQ38	Stoke Newington	Hawksley Road	>100 stunted plants & seedlings on a pavement	1992	B.S	Wurzell (1993) Kent (2000)
TQ38	Tower Hill	London Wall [i.e. remains of a section of Roman wall]	Plants on top of and at base of wall	1993	Lor Ecc staf	Game & Wf (1996)
TQ38	Tower of London	On the north side	A clump on south-facing outer retaining wall of the moat	1993	Lor Ecc staf	Game & Wf (1996)
YQ38	St. Katharine's	Pier	Small quantity on top of the river wall	1993	Lor Ecc staf	Game & Wf (1996)
TQ38	St Katharine's	Near the Dock	Not seen in 1993	<1993		Game & Wf (1996)
TQ38	Tower Hill	By Tower Hill Underground station	In a concrete planter	1994 & 1995		Game & Wf (1996)
TQ27	Kensington	Off Kensington High Street	[This was in Kensington Court]	1995	R.J Swi [De Ric	Burton (1993) Kent (2000)
TQ38	Mile End	Solebay Street, bridge over Regent's Canal		1995	Ter	Game & Wf (1996) p. 35
TQ38	Mile End	Woodison Street	"Sprouting from the gutter"	1995		Game & Wf (1996)
TQ38	Spitalfields	Brushfield Street	Rough ground by pavement	1995		Game & Wf (1996)
TQ38	Poplar	Bygrove School	Neglected shrub border	1995		Game & Wf (1996)
TQ38	Mile End Park	In or near Mile End Park	In quantity in recent years	<1995		Game & Wf (1996)
TQ38	Mile End		"Persistent in several places nr. M. E."	<2000		Kent (2000)
TQ38	Nr. Tower of London		"Persistent near the T. of L."	2000		Kent (2000)
TQ38	Bow	Junction of Regent's Canal & Hertford Union Canal	By canal tow path. C. 120 plants. TQ357832 and TQ358832	1996-2001	R.J Swi	Swindells (2001)
TQ38	Bow [Mile End]	By Woodison Road/ Copperfield Road	Regent's Canal towpath: large numbers TQ363821	2000	R.J Swi	Swindells (2001)
TQ38	Bow [Mile End]	By Woodison Road/ Copperfield Road	Regent's Canal towpath: 55 plants TQ363821	2001	R.J Swi	Swindells (2001)
TQ38	Poplar	Upper North	130 plants in front of almshouses	2001	R.J	Swindells (2001)

		Street	and at edge of playground of Bygrove School. TQ374810		Swi	
TQ37	Isle of Dogs	Manchester Road	In profusion in raised beds by George Green's School TQ384784	<2001	R.J Swi	Swindells (2
TQ37	Isle of Dogs	Manchester Road	40 plants at base of two street trees TQ384784	2001	R.J Swi	Swindells (2
TQ38	Shadwell	West side of Sutton Street	2 live plants and some shrivelled remains TQ351810	2001	R.J Swi	Swindells (2
TQ38	Tower Hill	On remains of Roman wall by Tower Hill Underground Stn.	250+ plants TQ336807	2001	R.J Swi	Swindells (2
TQ38	Nr. Tower of London	Trinity Square Gardens	c. 10 plants	2001	R.J Swi	Swindells (2
TQ27	Kensington	Kensington Court	One plant in same location as in 1995 TQ258795	2001	R.J Swi	Swindells (2
TQ38	Hackney	St. John's churchyard	TQ350852	2004	Jer	Personal communica 23 Septemb
TQ38	Shadwell	South side of Tarling Street	"A lot on the interface between the hoarding round the demolition site and the pavement."	2004	Ter	Personal communica 25 May 200
TQ38	Shadwell	Timberland Road alongside Sainsbury's	"Lots"	2004	Ter	Personal communica 25 May 200
22 Berkshire						
SP40	Wytham	Mill		1893?	G.C OX	Bowen (196 Crawley (20
SP50	Grandpont		Rare on rubbish tips; ground built over by 1897	1890	?	Crawley (20
SU46	Newbury			1918?	Dru	Bowen (196 Crawley (20
			Bowen (1968) regarded as errors all records in Druce (1897) except those from Wytham & Newbury.			
23 Oxfordshire						
	???		Waste places, roadsides, walls			Killick, <i>et al.</i>
			First record	c. 1776		Killick, <i>et al.</i>
SP50	Oxford	Merton College		1794 to 1906		Killick, <i>et al.</i>
SP50	Oxford	Botanic Garden		1794 to 1906		Killick, <i>et al.</i>
SP50	Oxford			1906		MANCH
SP50	Oxford	waste ground		1907	F.L Kel	BM
SP50	Oxford	Rose Lane	[nr. Botanic Gardens]	1909	J. F	BM
SP50	Marston	brickyards		1908		Killick, <i>et al.</i>
SP50	Marston			1915	Geo Cla Dru	BM
SP50	Marston			1923	Geo Cla Dru	BM
SP50	Marston	Brick Yard		1929	Tho Jac Fog	BM
SP50	Marston	SP5208		1936		Killick, <i>et al.</i>
SP50	Oxford	Becket Street	Restaurant yard	1981 on	J.R	Killick, <i>et al.</i>
SP50	Oxford	By former LMS station		1993	J.R	Killick, <i>et al.</i>
SP50	Oxford	St Thomas Church		1992	May	Killick, <i>et al.</i>
24 Buckinghamshire						
SU97	Nr. Eton	roadsides		1805	Got Bot guid	Druce (1926 Maycock & (2005)
SU98	Nr. Salt Hill	Railway		Pre 1926	Hb. Bar test Sal	Druce (1926

SU97	Slough	Nr. the Mill		??		Druce (1926) Maycock & (2005)
25 E. Suffolk						
TM04	Hadleigh			n.d.		Simpson (1974)
TM14	Ipswich	St. Mary-le-Tower churchyard		1974	F.W. Simpson	Simpson (1974)
TM14	Ipswich	St. Mary-le-Tower churchyard		1992	Mrs Hyc	BRC
TM14	Ipswich	St. Mary-le-Tower churchyard		1994	Mrs Hyc	BRC
TM14	Freston		On dumped soil in lay-by. One plant only.	1977	M.A. Det Cle	Simpson (1974) BRC; NCC
TM35	Marlesford			1997	Mrs God	BRC
26 W. Suffolk						
TL86	Bury St Edmunds			1773	Sir	Hind (1889) Simpson (1974)
TL76	Gazeley	In my field	On the edge of a heap of burnt ashes. "My man unfortunately destroyed them while I was from home, and before I could save the seed."	1878	Rev Tea	Hind (1889)
27 E. Norfolk						
TG24	Nr. Cromer			1957		Beckett, et al.
28 W. Norfolk						
TF90	Watton			1911		Beckett, et al.
TF90	Watton		Garden weed	1915	Fre Rot	BM
29 Cambridgeshire						
TF40	Wisbech	N. Brink, nr. Barton Lane	On an old wall	1797	Wm Skr	Perring, et al. (1964) + Cr website [2006]
TL45	Barnwell		[nr. Cambridge]	1818	Job	Perring, et al. (1964) + Cr website [2006]
TF40	Wisbech	N. Brink, nr. Barton Lane	At the foot of some railing occupying the site of an old wall on the N. Brink	1819	Wm Skr	Crompton v [2006]
TF40	Wisbech		From the bottom of some Paling...	1829		Crompton v [2006]
30 Bedfordshire						
TL14	Biggleswade	Railway siding		1952	J.G. LTH	Dony (1953) C. Boon, 2006 (pers. comm.)
TL03	Maulden	Arable field		1952	J.G. LTH	Dony (1953) C. Boon, 2006 (pers. comm.)
TL03	Maulden	Arable field		1954	J.G. LTH	C. Boon, 2006 (pers. comm.)
TL03	Flitwick	Railway sidings		1955	J.G.	BM
TL02	Sundon	Railway sidings		1957	T.C.	ABRN
TL03	Maulden	Arable field		1970, 1971, 1973, 1974	C.G.	C.G. Hanso (pers. comm.)
TL03	Maulden Moor	Derelict allotment		1983	C.G.	C.G. Hanso (pers. comm.)
TL03	Flitwick	Arable field		1971	J.G. C.M.	BM
TL03	Flitwick	Priestley's Farm	Arable fields	1975 to 1979	C.G.	C.G. Hanso (pers. comm.)
TL03	Flitwick	Priestley's Farm	Arable fields	1983 to 1986	C.G.	C.G. Hanso (pers. comm.)
TL03	Flitwick		TL 019332	1987 to 1996	C.G.	C. Boon, 2006 (pers. comm.)
TL03	Flitwick	Priestley's Farm	Arable fields	1988 to 2004	C.G. spe	C.G. Hanso (pers. comm.)

					BM	
TL03	Flitton		TL 062363	1987 to 1996	C.G.	C. Boon, 20 comm.)
TL03	Flitton	Mr Sharp's farm		1994	C.G.	C.G. Hanso (pers. comm.)
	31 Huntingdonshire		Casual			Wells (2003)
TL16	St. Neots	Railway sidings		1950	J.G.	Wells (2003)
TL27	Huntingdon	Railway sidings		1950	J.G.	Wells (2003)
TL37	Somersham	Rubbish dump		1968	T.C.	Wells (2003)
TL37	St. Ives	Part of bridge	Brick wall	1992	Lyn	Wells (2003)
	32 Northamptonshire			-		<u>Not in VcCC</u>
	33 E. Gloucestershire			-		<u>Not in VcCC</u>
	34 W. Gloucestershire					
ST67	Bristol	St. Philip's Marsh		1922	C.[I] Sar BR	
?	Bristol			1932?	B.E. p. 3 Bris	Riddelsdell, <i>et al.</i> (1948)
ST57	Bristol	Avonmouth Docks		1958	C. I Sar BR	
	36 Herefordshire			-		<u>Not in VcCC</u>
	37 Worcestershire					
SO74	Malvern	Midland Siding	"First certain record" (A&R, 1909)	1896	Tov	Amphlett & (1909)
SP04	Badsey & Littleton	Station	Wool alien, 7 herb. sheets	1953	C.M. Goc LTH	C. Boon, 20 comm.)
SP04	Charlton		Wool alien	1953	C.M. Goc LTH	C. Boon, 20 comm.)
SO94	Pinvin			1954	J.G. LTH	C. Boon, 20 comm.)
SP04	Evesham	Railway siding	2 herb. sheets	1955	C.M. Goc LTH Det Lou	C. Boon, 20 comm.)
SO94	Pinvin		In beet	1957	J.E.	BM
SP04	Evesham	Working Men's Club	Several plants scattered over 50 m. in car park & on adjoining pavements	2000	J.J. W.	W. Thomps (pers. comm.)
	38 Warwickshire			-		<u>Not in VcCC</u>
	39 Staffordshire					
SK22	Burton-on-Trent			1929	Jac	BM
	40 Shropshire					
SJ22	Nr. Oswestry	roadside		1947 (BRC)	Mis Lloy	Sinker, <i>et al.</i> <u>Not in VcCC</u>
	53 S. Lincolnshire					
??	Nr. Lincoln		Div. 13 (south of Lincoln) – no details given	n.d.		Gibbons (19)
	54 N. Lincolnshire					
TA20	Grimsby			1900	Arth LCH	Gibbons (19)
TF07	Langworth	Station		1908	J.S.	Gibbons (19)
SK88?	Nr. Gainsborough		Div. 5 - no details given	n.d.		Gibbons (19)
TF38?	Nr. Louth		Div. 8 – no details given	n.d.		Gibbons (19)
TF09	Brandy Wharf	Canal		1948	R. E.	Gibbons & (1985)
TA30	Cleethorpes		Garden	1960	R.C.	BM
TF58	Mablethorpe		Waste ground	1960	J.A. B.M. & D.	NCC files

					McC	
SK97	Lincoln		SK980704 [Cliffe Farm?]	1990	E.V.	BRC
	55 Leicestershire		Local & viatical in Europe. Waste places in Leics.			Horwood & (1933)
			Casual			Primavesi & (1988)
??	??		one locality only	Pre 1933	Hor Noe (1933)	Primavesi & (1988)
SK50	Leicester	Central Street Roundabout		1964	W.V. Her [P&E] herl at LSI not is th	Primavesi & (1988)
SP78	Market Harborough			1979	Car	BRC
	56 Nottinghamshire			-		<u>Not in</u> VcCC
	57 Derbyshire					
SK35	Wingfield Manor			1789	J. F.	BRC
SK22	Nr. Burton on Trent	New Burton and Ashby Road	"It grew on the new Burton and Ashby road, near Burton, when the road was first made" [Claimed by H&N and P&E as the first record for Leics.]	c. 1863		Brown in M (1863) Horwood & (1933) Primavesi & (1988)
SK36	Holy Moor	Tip above Cat Hole	SK326674	1985	M.C.	Moyes & W (2002) & BF
	58 Cheshire					
SJ39	Seacombe	Ballast heaps	SJ3290	1871	J.H.	MANCH
SJ38	Little Storeton			1912	H.V. Har	Green (1933)
SJ28	Nr. Bidston Hill			1923	H.V. Har	Green (1933)
	59 S. Lancashire					
SJ89	Manchester			1881	?	BM
SD70	Bolton	Bradford Park		1908	The Gre	BON
SD31	Nr. Southport			1932	Mis (B.I. 1933)	Savidge, et
SD80	Middleton	Stake Hill	wool tip	1960	C.E.	Savidge, et
	60 W. Lancashire		No records traced			VcCC
	61 S.E. Yorkshire					
TA02	Hull	docks		1902	Wil (1933)	Wilmore (2002)
TA02	Hull	Albert Dock	Near the lock. One dried plant.	2000	Joh	R. Middleto Hull Flora w <u>Not in</u> VcCC
	62 N.E. Yorkshire			-		
	63 S.W. Yorkshire					
SE42	Pontefract	nr. Castle	at the foot of walls, a few plants with <i>Diplotaxis ten.</i> & <i>Cheiranthus cheiri</i>	1869		Lees (1888) Wilmore (2002)
SE02	Wheatley	Dapper Mill		1893-1894	Cru Cro (1933)	Wilmore (2002)
SE12	Elland	malt kilns		1894	Cru Cro (1933)	Wilmore (2002)
SE11	Kirkheaton	Jarmanes' Wool waste dump		1958	Flor Hou L. M.	Wilmore (2002)
SE13	Shipley			1959	L. M.	Wilmore (2002)
	Ardsley		shoddy fields, numerous	1980s	J. M.	Lavin & Wil (1994)
SE32	Lofthouse Gate		shoddy fields, numerous	1980s	J. M.	Lavin & Wil (1994)
SE22	East Ardsley		Shoddy fields SE2924	1981-	J. M.	Wilmore (2002)

				1982		
SE22	East Ardsley		Shoddy fields SE2924	1984-1987	J. M.	Wilmore (2000)
SE22	East Ardsley		Shoddy fields SE2924	1989	P.P. con Ric	Wilmore (2000)
SE22	East Ardsley		Shoddy fields SE2924	1990	J. M.	Wilmore (2000)
SE22	East Ardsley		Shoddy fields SE2924	1993-1994	J. M.	Wilmore (2000)
SE32	Newton Hill		Shoddy fields SE3222	1981	J. M.	Wilmore (2000)
SE32	Newton Hill		Shoddy fields SE3222	1983-1987	J. M.	Wilmore (2000)
SE32	Newton Hill		Shoddy fields SE3222	1992-1994	J. M.	Wilmore (2000)
SE32	Rothwell Haigh		Shoddy field SE3228	1982	J. M.	Wilmore (2000)
SE32	Kirkhamgate		Shoddy field	1983	J. M.	Wilmore (2000)
SE32	East Ardsley	Croft Avenue	Self-sown in gardens SE3222	1984	J. M.	Wilmore (2000)
SE22	East Ardsley	Woodhouse Lane Farm	Shoddy field SE2924	1992	J. M.	Wilmore (2000)
SE32	Nr. Wrenthorpe, Wakefield		Shoddy field(s) SE3024	1992	J. M.	Wilmore (2000)
SE32	Nr. Wrenthorpe, Wakefield		Shoddy field(s) SE3123	1992	J. M.	Wilmore (2000)
SE32	Nr. Wrenthorpe, Wakefield		Shoddy field(s) SE3223	1992	J. M.	Wilmore (2000)
SE32	Rothwell Haigh		Shoddy tip SE3227	1996	J. M.	Wilmore (2000)
SE01	Slaithwaite	Row Farm	Waste dumps incl. shoddy used as cattle bedding SE063168	2003	D.V. Shi	Shimwell (2000)
SE01	Slaithwaite	Row Farm	Waste dumps incl. shoddy used as cattle bedding SE063168	2005	D.V. Shi	Shimwell (2000)
	64 Mid –W. Yorkshire		Sporadic but fugitive & v. rare			Lees (1888)
			Rare casual, regular, if scattered colonist of crop fields treated with shoddy waste			Lavin & Wilmore (1994)
SE55	York	old walls		1850	Jos Blay spe	Lees (1888), Lavin & Wilmore (1994)
SE55	York	City walls		1872	F.A.	BM
SE13	Esholt		Shoddy tip SE1739	1959	Flori Hou	Wilmore (2000)
SE11	Baildon	Coach Road	Tip	1959-1962	Flori Hou	Wilmore (2000)
SE13	Nr. Shipley		SE158381	1962	G.C. SUI	BRC
	65 N.W. Yorkshire					
SE38	Berryhills			1958-1960	C.M. (det Lou)	Wilmore (2000)
	66 Co. Durham					
NZ53	Old Hartlepool [= West Hartlepool?]	on the ballast hills	rare	1862	M.A. (1862)	Graham (1993)
NZ45	Seaburn			1977	D.V. Shi	BRC
	67 S. Northumberland			-		<u>Not in VcCC</u>
	68 Cheviot		Colonist. Long extinct. No recent record.			Swan (1993)
NU05	Berwick	town walls		Pre 1690	Ray p. 1 Ray p. 2	Swan (1993)
NU05	Berwick	On the Wall	"between Fisher's-Battery and King's-Mount."	c. 1807		Thompson (1993)
NU05	Berwick	On the walls	"Most abundant at the Pier-gate."	c. 1829	Geo Joh	Johnston (1993)
NU05	Berwick	town walls		1831	R.C. Em HA	Swan (1993)

NT95	Berwick	Embankment of railway station	"In great profusion" in 1847, "only a few specimens" in 1849, "not an individual remained" in 1851.	1847 to 1849	Geo. Johnston (1847)	Johnston (1847)
NU05	Berwick	town walls		1850	Robt. Em. BM	Swan (1993)
NU05	Berwick	Town walls	"It grows in profusion about the Ness-Gate and there only..."	1853	Geo. Johnston (1853)	Johnston (1853)
NU05	Berwick		Pier Gate	1858	Will. Ric. BM	BM
NU05	Berwick			1865	Will. Ric. BM	BM
NU05	Berwick	town walls		1872	F.A. BM	Swan (1993)
NU05	Berwick-upon-Tweed			1873	F.A. HLU	HLU
NU05	Berwick-upon Tweed			1874	A. Bro. HLU + BM	HLU + BM
NU05	Berwick			1875	Phi. Bro. Ma. BO	
NU05	Berwick	town walls		1919	A.H. (BA) 23:	Swan (1993)
NU11	Hulne Park			1857	W. Ric. BM	Swan (1993)
	69 Westmorland			-		Not in VcCC
	70 Cumberland					
NY23	Cockermouth	Castle		Pre 1898	Hoc. (1898)	Halliday (1993)
NY15	Silloth			Pre 1898	Hoc. (1898)	Halliday (1993)
NY44	Ivegill	High Head Castle		Pre 1898	Hoc. (1898)	Halliday (1993)
NY44?	River Roe	Valley of (High Head Castle?)		c. 1890s	J. C. CLI	Halliday (1993)
NY15	Silloth	docks		1949	N.V. Simr.	Halliday (1993)
	Wales					
	35 Monmouthshire					
SO51	Monmouth		[derived from map ref. SO51]	After 1930		Ellis (1983)
	41 Glamorgan					
ST17	Cardiff		Common on ballast	c. 1886	Joh. Storrie, (1886) Wade, et al	Wade, et al
SO00	Aberdare			c. 1907	B.A. Wade, et al	Wade, et al
ST17	Coedrhiglan [= Coedarhydyglyn]		ST1075	c. 1907	G. & H. Wade, et al	Wade, et al
ST17	Penarth			c. 1907	Pro. Tro. Wade, et al	Wade, et al
SS69	Swansea			c. 1907	Rev. Rid. Wade, et al	Wade, et al
ST17	Cardiff	Bute Dock		1909	C.T. NM	Wade, et al
ST16	Barry	Docks		1924	R.L. A.E. NM	Wade, et al
ST17	Cardiff	Splott		1926	Mis. Vac. A.E. NM	Wade, et al
ST17	Cardiff	Penarth Road	Rubbish heap	1933	R.L. SLBI	SLBI
ST27	Roath			1974	R.C. NM	Wade, et al
	42 Breconshire			-		Not in VcCC
	43 Radnorshire					
SO06	Llandrindod Wells area			1896	J.B. Buf. (1906)	Woods (1993)

					p. 1	
	44 Carmarthenshire					
SN41	Llangyndeyrn			1911	D. F. Har (19)	May (1967)
SN42	Carmarthen			1911	D. F. Har (19)	May (1967)
SN50	Llangennech			1912	D. F. Har (19)	May (1967)
SN42	Nr. Carmarthen		[derived from map ref. SN42]	Post 1930		Ellis (1983)
SN62	Nr Llandeilo		[derived from map ref. SN62]	Post 1930		Ellis (1983)
	45 Pembrokeshire			-		<u>Not in</u> VcCC
	46 Cardiganshire			-		<u>Not in</u> VcCC
	47 Montgomeryshire			-		<u>Not in</u> VcCC
	48 Merioneth			-		<u>Not in</u> VcCC
	49 Caernarvonshire			-		<u>Not in</u> VcCC
	50 Denbighshire			-		<u>Not in</u> VcCC
	51 Flintshire			-		<u>Not in</u> VcCC
	52 Anglesey			-		<u>Not in</u> VcCC
	71 Isle of Man			-		<u>Not in</u> VcCC
	Scotland			-		<u>Not in</u> VcCC
	72 Dumfriesshire			-		<u>Not in</u> VcCC
	73 Kirkcudbrightshire			-		<u>Not in</u> VcCC
	74 Wigtownshire			-		<u>Not in</u> VcCC
	75 Ayrshire			-		<u>Not in</u> VcCC
	76 Renfrewshire			-		<u>Not in</u> VcCC
	77 Lanarkshire					
NS56	Glasgow		[Could be in v.c. 76?]	1958	C.M. Dickson, et	<u>Not in</u> VcCC
	78 Peeblesshire			-		<u>Not in</u> VcCC
	79 Selkirkshire					
NT43	Galashiels			1969	J.E	BM
	80 Roxburghshire					
NT53	Nr. Galashiels	By R. Tweed 2 m. below Galashiels	On damp soil on shingle	1909	Ida Hay	Hayward & (1919)
	?			n.d.	Ma We	Lousley (19
NT53	Galashiels			1964	Ma We	BRC
	81 Berwickshire			-		<u>Not in</u> VcCC
	82 E. Lothian			-		<u>Not in</u> VcCC
	83 Mid Lothian					
NT27	Leith	Docks		1903	J. M	BM
NT27	Leith			1905	?	BM
NT27	Nr. Slateford			1906	?	BM
	84 W. Lothian			-		<u>Not in</u> VcCC
	85 Fife					
NT08	Nr Dunfermline		[Derived from map ref. NT08]	1872	Bal (19	Ballantyne (BRC
NT28	?			1880	Bal (19	Ballantyne (BRC
NT49	Earlsferry		[Derived from map ref. NT49]	n.d.	Bal (19	BRC
NO40	?			1887	Bal (19	Ballantyne (BRC
NO41	Guardbridge		[Derived from map ref. NO41]	1960	?	Ballantyne (BRC
NO41	Guardbridge			1961	Cha	BM
	86 Stirlingshire			-		<u>Not in</u> VcCC
	87 W. Perth			-		<u>Not in</u> VcCC

	88 Mid Perth			-		Not in VcCC
	89 E. Perth			-		Not in VcCC
	90 Angus			-		Not in VcCC
	91 Kincardineshire			-		Not in VcCC
	92 S. Aberdeen			-		Not in VcCC
	93 N. Aberdeen			-		Not in VcCC
	94 Banffshire			-		Not in VcCC
	95 Moray					
NJ05	Waterford	Rubbish tip	[nr. Forres]	1891	Jan FR:	Webster (19
NJ26	Elgin	tip		1961	E, We	Webster (19
	96 Easterness			-		Not in VcCC
	97 Westerness			-		Not in VcCC
	98 Main Argyll			-		Not in VcCC
	99 Dunbarton			-		Not in VcCC
	100 Clyde Isles			-		Not in VcCC
	101 Kintyre			-		Not in VcCC
	102 S. Ebudes			-		Not in VcCC
	103 Mid Ebudes			-		Not in VcCC
	104 N. Ebudes			-		Not in VcCC
	105 W. Ross			-		Not in VcCC
	106 E. Ross			-		Not in VcCC
	107 E. Sutherland			-		Not in VcCC
	108 W. Sutherland			-		Not in VcCC
	109 Caithness			-		Not in VcCC
	110 Outer Hebrides			-		Not in VcCC
	111 Orkney			-		Not in VcCC
	112 Shetland			-		Not in VcCC
	S Channel Islands					
	Jersey		Record in Babington (1839) rejected by Lester Garland			Le Sueur (1
	Guernsey					
	?		"Sans specimen" (McClintock, 1975)	1941	?	McClintock
	Alderney			-		Not in McCl (1975)
	Sark			-		Not in McCl (1975)
	Herm			-		Not in McCl (1975)
	Ireland					
	H1 S. Kerry			-		Not in Reyn (2002)
	H2 N. Kerry			-		Not in Reyn (2002)
	H3 W. Cork			-		Not in Reyn (2002)
	H4 Mid Cork			-		Not in Reyn (2002)
	H5 E. Cork			-		Not in Reyn (2002)
	H6 Co. Waterford			-		Not in Reyn (2002)
	H7 S. Tipperary			-		Not in Reyn (2002)
	H8 Co. Limerick			-		Not in Reyn (2002)
	H9 Co. Clare			-		Not in Reyn (2002)
	H10 N. Tipperary			-		Not in Reyn (2002)
	H11 Co. Kilkenny			-		Not in Reyn (2002)
	H12 Co. Wexford			-		Not in Reyn (2002)
	H13 Co. Carlow			-		Not in Reyn (2002)
	H14 Laois			-		Not in Reyn

						(2002)
	H15 S.E. Galway			-		<u>Not in</u> Reyn (2002)
	H16 W. Galway					
M22	Galway	outskirts		1969	J.M	BRC; Prest (2002) <u>Not in</u> Reyn (2002)
	H17 N.E. Galway			-		<u>Not in</u> Reyn (2002)
	H18 Offaly			-		<u>Not in</u> Reyn (2002)
	H19 Co. Kildare			-		<u>Not in</u> Reyn (2002)
	H20 Co. Wicklow			-		<u>Not in</u> Reyn (2002)
	H21 Co. Dublin			-		<u>Not in</u> Reyn (2002)
O13	Dublin		"It grows upon Walls as between <i>Dolphin's Barn and Cork Bridge</i> " [Probable record acc. to Colgan, (1904)]	1727	Thr (17	Colgan (190 Dublin N.F.)
O13	Dublin			1818	Wa (18	Dublin N.F.)
O13	Dublin		common	to 1820	Ter MS	Dublin N.F.)
O13	Dublin		Common about	1836	Mac (18	Dublin N.F.)
O13	Dublin	Roadside		1848	TCI T.C	BRC
O13	Dublin	Suburbs	Frequent	1901		Praeger (19
O13	Dublin		"...of late it has become quite rare, though continuing to appear in small quantity in many stations. Its favourite habitat is along unpaved footways at the base of walls, and its increasing rarity is no doubt mainly due to the general introduction of concreted foot pavements throughout the suburban townships."	1904	Col (19	Dublin N.F.)
O13	Dublin		Extremely rare			Dublin N.F.)
O13	Dublin City	Clanbrasil Street	On ruined walls in	1894	Nat Col	Colgan (190 Dublin N.F.)
O13	Dublin City	Island Bridge [= Islandbridge]		1902	Nat Col	Colgan (190 Dublin N.F.)
O13	Dublin	Islandbridge		n.d.	TCI T.C	BRC
O13	Dublin	Kimmage Road		1892	Mor Cyl	Colgan (190 Dublin N.F.)
O13	Dublin	Kimmage Road		1901	H.V Dur	Colgan (190 Dublin N.F.)
O13	Dublin City	Marrowbone Lane		1900	Nat Col	Colgan (190 Dublin N.F.)
O13	Dublin City	Mount Brown		1894 to 1902	Nat Col	Colgan (190 Dublin N.F.)
O13	Dublin	South Circular Road	[Islandbridge to Dolphin's Barn, etc.]	1892	Mor Cyl	Colgan (190 Dublin N.F.)
O13	Ball's Bridge		Abundant	c. 1865	Joh	Colgan (190 Dublin N.F.)
O13	Ball's Bridge	Along branch railway to BB show yard	Frequent	1902	Nat Col	Colgan (190 Dublin N.F.)
O22	Ballybrack	Martello Tower	A few plants	1919	A.V Anc (19 Sup	Dublin N.F.)
O13	Ballyfermot	By Grand Canal	[nr. Bluebell]	1930	And (19 Sup	Dublin N.F.)

O13	Camden Place	Off Harcourt St.		1992	M. V Jac	Dublin N.F.C.
O13	Chapelizod	Bridge	Northern end of	1902	Nat Col	Colgan (190 Dublin N.F.C.)
O13	Chapelizod	Cottage roof in		1903	Scu	Colgan (190 Dublin N.F.C.)
O13	Chapelizod Village	Nr. The bridge	On steps of a derelict building	1986	Mar Nor DB	Reynolds (2002) Dublin N.F.C. (1998)
O13	Clonskeagh		[nr. Milltown]	?	(Mc Add	Colgan (1904) Dublin N.F.C. (1998)
O13	Clontarf	about	Common	?	Cyl	Colgan (190 Dublin N.F.C.)
O13	Clontarf	Annesley Bridge		1866	Har	Colgan (190 Dublin N.F.C.)
O13?	Clontarf	Dye House Lane		1866	Har	Colgan (190 Dublin N.F.C.)
O13	Drumcondra	Roadside		1872	W.F Her Mus	Colgan (190 Dublin N.F.C.)
O13	Finglas	Rectory Yard		1921?	J.P Anc (19 Sup	Dublin N.F.C.
O13	Glasnevin	Going to	Beside walls	?	Ir. f Col	Colgan (190 Dublin N.F.C.)
O13	Glasnevin	Common about		?	Cyl	Colgan (190 Dublin N.F.C.)
O13	Glasnevin	Corey Lane			Rev Car Her Mus	Dublin N.F.C.
O13	Glasnevin			1871	W.T This Dye	BM
O13	Glasnevin			1871	A.G TCI (col Ric	BRC
O13	Harold's Crop [= Harold's Cross?]			1892	H.C	BM
O23	Howth	Below Claremont	A few plants by the shore	1887	Flo	Colgan (190 Dublin N.F.C.)
O13	Inchicore			1887	R.V	BM
O13	Nr. Inchicore			1894	?	Colgan (190 Dublin N.F.C.)
??	Nr. Kingsbridge	Roadside		1890	R.V BM Cyl	Colgan (190 Dublin N.F.C.)
O22	Kingstown [Dun Laoghaire]	On the railway		1893	(NC Cyl	Dublin N.F.C.
O03	Knockmaroon Hill	By Liffey at foot of		1921	J.P Anc (19 Sup	Dublin N.F.C.
O13	Nr. Lansdowne Road	Railway station	Still on path by railway	1948	Anc (19 Sup	Dublin N.F.C.
O25	Loughshinny	Harbour	Foot of wall	1953	Anc (19 Sup	Dublin N.F.C.
O25	Loughshinny	Harbour		1985	Ros Fitz Dec Doc	Dublin N.F.C. Reynolds (2

O13	Merrion	To near Westland Row [now Pearse Station near Trinity College?]	At intervals along the railway [which could include Sandymount, Serpentine Ave., Lansdowne Road, etc.]	1903	Nat Col	Colgan (190 Dublin N.F.)
O13	Nr. Merrion	Station	Waste ground	1903	NC	Dublin N.F.)
O13	Milltown	Roadsides?	[nr. Conskeagh]	?	(Mc Adc	Colgan (190 Dublin N.F.)
O13	Mount Argus	spoilbanks	Now gone	1948	And (19 Sup	Dublin N.F.)
O12	Rathfarnham	South of	Roadsides	?	(Mc Adc	Colgan (190 Dublin N.F.)
O13	Rathgar	By Dodder river		?	Scu Cyt	Colgan (190 Dublin N.F.)
O13	Rathmines			1891	H.C	BM
O23?	Ringsend	At end of Point	Waste ground	1976	Mar Sca	Dublin N.F.)
O22	Salthill	On the railway		1859	Her Bar	Colgan (190 Dublin N.F.)
O13	Sandymount			1849	Her Ste	Colgan (190 Dublin N.F.)
O13	Sandymount		Abundant	c. 1865	Joh	Colgan (190 Dublin N.F.)
O13	Sandymount	By the beach	Waste ground	1902	Nat Col	Colgan (190 Dublin N.F.)
O13	Sandymount	Serpentine Ave.	E. side of railway	1987	Sylh Rey	Dublin N.F.)
O13	Sidney Parade [= Sydney Parade]	On the railway at		1867	W.C Her Gla	Colgan (190 Dublin N.F.)
O23	Sutton	Railway station	Roadside east of	c. 1895	R. L Pra (18	Colgan (190 Dublin N.F.)
O23	Sutton	The Cosh		1954	? A (19 Sup	Dublin N.F.)
O14	Swords	In the main street	Sparingly	1893 to 1902	Nat Col	Colgan (190 Dublin N.F.)
O14	Swords			1918	TCI T.C	BRC
O14	Swords			1937	J.E	BM
O14	Swords	About Swords Castle	Still a few plants	1956	? A (19 Sup	Dublin N.F.)
O12	Windy Harbour [= Windy Harbour?]			1900	Rot Pra	Praeger (1901); Colgan (190 Dublin N.F.)
O13	? (District 4)	Cabra Road	Sparingly on	1893	Col	Colgan (190 Dublin N.F.)
O12	? (District 7)	Templeogue Bridge	Roadsides near	1893		Colgan (190 Dublin N.F.)
O12	? (District 7)	Nr. Templeogue Mill		1894		Colgan (190 Dublin N.F.)
O13	? (District 7)	Nr. Blue Bell [= Bluebell]		1894		Colgan (190 Dublin N.F.)
	H22 Meath			-		<u>Not in</u> Reyn (2002)
	H23 Westmeath			-		<u>Not in</u> Reyn (2002)
	H24 Co. Longford			-		<u>Not in</u> Reyn (2002)
	H25 Co. Roscommon			-		<u>Not in</u> Reyn (2002)
	H26 E. Mayo			-		<u>Not in</u> Reyn (2002)
	H27 W. Mayo			-		<u>Not in</u> Reyn (2002)
	H28 Co. Sligo			-		<u>Not in</u> Reyn (2002)
	H29 Co. Leitrim			-		<u>Not in</u> Reyn

						(2002)
	H30 Co. Cavan			-		<u>Not in Reyn</u> (2002)
	H31 Co. Louth			-		<u>Not in Reyn</u> (2002)
	H32 Co. Monaghan			-		<u>Not in Reyn</u> (2002)
	H33 Fermanagh			-		<u>Not in Reyn</u> (2002)
	H34 E. Donegal			-		<u>Not in Reyn</u> (2002)
	H35 W. Donegal			-		<u>Not in Reyn</u> (2002)
	H36 Tyrone			-		<u>Not in Reyn</u> (2002)
	H37 Co. Armagh			-		<u>Not in Reyn</u> (2002)
	H38 Co. Down					
J37	Nr. Ballymacarrett	Halt	Waste ground	1915	N. C Car (19	Reynolds (2
	H39 Co. Antrim					
J37	Stranmillis			1910	<i>Flo</i> <i>Irel</i> (19: eds	Reynolds (2
	H40 Co. Londonderry					<u>Not in Reyn</u> (2002)

Abbreviations of herbaria

ABRN	Centre for Ecology and Hydrology, Monks Wood Herbarium
BM	Natural History Museum, London [formerly British Museum (Natural History)]
BON	Bolton Museum and Art Gallery
BRSTMsa	City Museum and Art Gallery, Bristol (Sandwith Herbarium)
CGE	University of Cambridge Herbarium
CLE	Carlisle Museum and Art Gallery
DBN	Herbarium, National Botanic Gardens, Glasnevin, Dublin
DZS	Wiltshire Archaeological and Natural History Society, The Museum, Devizes
E	Royal Botanic Garden, Edinburgh
FRS	Falconer Museum, Forres
HAMU	Hancock Museum, Newcastle upon Tyne
HLL	University of Hull Herbarium (formerly at the College of Higher Education, Kingston upon Hull)
HLU	University of Hull Herbarium
K	Royal Botanic Gardens, Kew
LCH	Letchworth Museum and Art Gallery
LCN	Lincoln City and County Museum
LDS	University of Leeds
LSR	Leicestershire Museums, etc.
LTN	Luton Museum and Art Gallery
MANCH	Manchester Museum
MNE	Maidstone Museum and Art Gallery
NMW	National Museum of Wales
SLBI	South London Botanical Institute
SUN	Sunderland Museum and Art Gallery
TCD	School of Botany, University of Dublin, Trinity College

Other abbreviations

B.E.C.	Botanical Exchange Club
BNC	History of the Berwickshire Naturalists' Club
BRC	Biological Records Centre
Dublin N.F.C.	Dublin Naturalists' Field Club
NCC	Nature Conservancy Council
VcCC	<i>Vice-county Census catalogue</i> (Stace, <i>et al.</i> , 2003)

Appendix 2: Presence (1) and absence (0) by 50 year date classes for every 10 Km square in which *Sisymbrium irio* has been recorded

	1651- 1700	1701- 1750	1751- 1800	1801- 1850	1851- 1900	1901- 1950	1951- 2000
NJ05	0	0	0	0	1	0	0
NJ26	0	0	0	0	0	0	1
NO40	0	0	0	0	1	0	0
NO41	0	0	0	0	0	0	1
NS56	0	0	0	0	0	0	1
NT08	0	0	0	0	1	0	0
NT27	0	0	0	0	0	1	0
NT28	0	0	0	0	1	0	0
NT43	0	0	0	0	0	0	1
NT53	0	0	0	0	0	1	1
NT95	0	0	0	1	0	0	0
NU05	1	0	0	1	1	1	0
NU11	0	0	0	0	1	0	0
NY15	0	0	0	0	1	1	0
NY23	0	0	0	0	1	0	0
NY44	0	0	0	0	1	0	0
NZ45	0	0	0	0	0	0	1
NZ53	0	0	0	0	1	0	0
SD31	0	0	0	0	0	1	0
SD70	0	0	0	0	0	1	0
SD80	0	0	0	0	0	0	1
SE02	0	0	0	0	1	0	0
SE11	0	0	0	0	0	0	1
SE12	0	0	0	0	1	0	0
SE13	0	0	0	0	0	0	1
SE22	0	0	0	0	0	0	1
SE32	0	0	0	0	0	0	1
SE38	0	0	0	0	0	0	1
SE42	0	0	0	0	1	0	0
SE55	0	0	0	1	1	0	0
SJ22	0	0	0	0	0	1	0
SJ28	0	0	0	0	0	1	0
SJ38	0	0	0	0	0	1	0
SJ39	0	0	0	0	1	0	0
SJ89	0	0	0	0	1	0	0
SK22	0	0	0	0	1	1	0
SK35	0	0	1	0	0	0	0
SK36	0	0	0	0	0	0	1
SK50	0	0	0	0	0	0	1
SK97	0	0	0	0	0	0	1
SN41	0	0	0	0	0	1	0
SN42	0	0	0	0	0	1	0
SN50	0	0	0	0	0	1	0
SN62	0	0	0	0	0	1	0
SO00	0	0	0	0	0	1	0

SO06	0	0	0	0	1	0	0
SO51	0	0	0	0	0	1	0
SO74	0	0	0	0	1	0	0
SO94	0	0	0	0	0	0	1
SP04	0	0	0	0	0	0	1
SP40	0	0	0	0	1	0	0
SP50	0	0	1	1	1	1	1
SP78	0	0	0	0	0	0	1
SS69	0	0	0	0	0	1	0
ST16	0	0	0	0	0	1	0
ST17	0	0	0	0	1	1	0
ST22	0	0	0	0	0	0	1
ST27	0	0	0	0	0	0	1
ST36	0	0	0	0	0	1	0
ST47	0	0	0	0	0	1	0
ST57	0	0	0	0	0	1	1
ST67	0	0	0	0	0	1	0
SU16	0	0	0	0	1	0	0
SU20	0	0	0	0	0	1	0
SU46	0	0	0	0	0	1	0
SU50	0	0	0	0	0	1	0
SU73	0	0	0	0	0	0	1
SU75	0	0	0	0	0	1	0
SU97	0	0	0	1	0	1	0
SU98	0	0	0	0	0	1	0
SW42	0	0	0	0	1	0	0
SW43	0	0	0	0	1	1	0
SW53	0	0	0	0	0	1	0
SW73	0	0	0	0	0	1	0
SW74	0	0	0	0	0	1	0
SW83	0	0	0	0	0	1	0
SX05	0	0	0	0	0	1	0
SX99	0	0	0	0	0	0	1
SY79	0	0	0	0	1	0	0
SZ48	0	0	0	0	1	0	0
TA02	0	0	0	0	0	1	1
TA20	0	0	0	0	1	0	0
TA30	0	0	0	0	0	0	1
TF07	0	0	0	0	0	1	0
TF09	0	0	0	0	0	1	0
TF40	0	0	1	1	0	0	0
TF58	0	0	0	0	0	0	1
TF90	0	0	0	0	0	1	0
TG24	0	0	0	0	0	0	1
TL02	0	0	0	0	0	0	1
TL03	0	0	0	0	0	0	1
TL14	0	0	0	0	0	0	1
TL16	0	0	0	0	0	1	0
TL23	0	0	0	0	0	1	0
TL27	0	0	0	0	0	1	0
TL31	0	0	0	0	1	1	0
TL37	0	0	0	0	0	0	1

TL45	0	0	0	1	0	0	0
TL76	0	0	0	0	1	0	0
TL81	1	0	0	0	0	0	0
TL86	0	0	1	0	0	0	0
TM14	0	0	0	0	0	0	1
TM35	0	0	0	0	0	0	1
TQ17	0	0	0	0	0	0	1
TQ18	0	0	0	1	0	0	1
TQ24	0	0	0	0	0	0	1
TQ27	1	0	1	1	0	0	1
TQ28	1	0	0	0	0	0	1
TQ36	0	0	0	0	0	0	1
TQ37	1	1	1	1	0	0	1
TQ38	1	1	1	1	0	1	1
TQ48	0	0	0	1	0	0	1
TQ53	0	0	0	0	0	1	0
TQ57	0	0	0	0	0	0	1
TQ65	0	0	0	0	0	0	1
TQ76	0	0	0	0	1	0	0
TR25	0	0	0	0	0	0	1
TR26							1
TR35							1
J37	0	0	0	0	0	1	0
M22	0	0	0	0	0	0	1
O03	0	0	0	0	0	1	0
O12	0	0	0	0	1	0	0
O13	0	1	0	1	1	1	1
O14	0	0	0	0	1	1	1
O22	0	0	0	0	1	1	0
O23	0	0	0	0	1	0	1
O25	0	0	0	0	0	0	1
Total	6	3	7	13	36	51	53

Appendix 3: Field records of *Sisymbrium irio* from urban sites in London and Dublin, April 2004 to August 2006

LBTH = London Borough of Tower Hamlets

RJS = R.J. Swindells

TL = Terry Lyle

Location 1	Location 2	Location 3	Location 4/notes	O.S. Grid Ref	Date	No of plants	Recorder(s)
LBTH	Limehouse	Mile End Park	Disturbed ground recently seeded to grass	TQ365816	26-04-2004	9	RJS
LBTH		Mile End Stadium	At base of wall by the old main entrance	TQ36478176	26-04-2004	5	RJS
LBTH	Mile End	Between Eric St. & Maplin St.	At base of wall & in gutter of slope to garages	TQ366824	18-05-2004	44	RJS
LBTH		Mile End Park	By seat overlooking Regent's Canal	TQ36348208	18-05-2004	4	RJS
LBTH		Mile End Stadium	On clinker & rubble from demolished buildings	TQ36498177	18-05-2004	c. 1,000	RJS
L.B. Hackney	Hackney	St. John-at-Hackney churchyard	Young plants at base of wall	TQ3501785235	27-09-2004	c. 30	RJS
L.B. Hackney	Hackney	St. John-at-Hackney churchyard	Small seedlings in neglected flowerbed	TQ3501785235	27-09-2004	c. 150	RJS
L.B. Hackney	Hackney	St. John-at-Hackney churchyard	Fruiting plants in neglected flowerbed	TQ3501785235	27-09-2004	5	RJS
L.B. Hackney	Hackney	St. John-at-Hackney churchyard	Growing from a partially blocked drain	TQ3501785235	27-09-2004	1	RJS
LBTH	Tower Hill	Remains of Roman wall		TQ335807	28-09-2004	313	RJS
LBTH	Tower of London	North wall of moat, N. side		TQ336807	28-09-2004	>33	RJS
LBTH	Bow Wharf	Junction of Regent's & Hertford Union Canals	Base of walls	TQ358832	09-12-2004	Not counted	RJS
LBTH	Limehouse	Salmon Lane at corner of Camdenhurst St.	Front garden	TQ362813	14-06-2005	c. 40	RJS
L.B. Hackney	Hackney	St. John-at-Hackney churchyard	A patch in ground disturbed by refurbishment project	TQ3502785205	27-04-2006	c. 70	RJS

L.B. Hackney	Hackney	St. John-at-Hackney churchyard	More in ground disturbed by refurbishment project	TQ3500485231	27-04-2006	>200	RJS
L.B. Hackney	Hackney	St. John-at-Hackney churchyard	Scattered elsewhere in the churchyard	TQ350852	27-04-2006	c. 180	RJS
L.B. Hackney	Hackney	St. John-at-Hackney churchyard	Small plants drying out under a privet hedge	TQ3585	27-04-2006	c. 60	RJS
LBTH	Whitechapel	New Road (adjacent to 119)	Base of wall and stony cracks in a car park	TQ344816	03-05-2006	>60	RJS & TL
LBTH	Whitechapel	Vine Court (off Whitechapel Road)	Base of walls & in pavement cracks	TQ34418165	03-05-2006	>150	RJS & TL
LBTH	Whitechapel	Nelson St.	Base of wall	TQ347813	03-05-2006	3	RJS & TL
LBTH	Whitechapel	Nelson St.	Waste ground covered in gritty broken tarmac	TQ347813	03-05-2006	c. 30	RJS & TL
LBTH	Whitechapel	Nelson St.	Base of walls around car park	TQ347813	03-05-2006	c. 50	RJS & TL
LBTH	Shadwell	Tarling St.	Pavement edge. Many plants weedkilled	TQ350811	03-05-2006	>30	RJS & TL
LBTH	Shadwell	Tarling Street	Base of wall in a discrete 0.5 metre stretch	TQ349811	03-05-2006	c. 30	RJS & TL
LBTH	Shadwell	Deancross St.	Base of street tree. Large plants	TQ349811	03-05-2006	2	RJS & TL
LBTH	Limehouse	Salmon Lane	Front garden of no. 65. Seedlings, a few flowering	TQ362813	03-05-2006	c. 20	RJS & TL
LBTH	Limehouse	Salmon Lane	Car park next to no. 65	TQ362813	03-05-2006	6	RJS & TL
LBTH		Rhodeswell Road	Entrance to Mile End Park (King George's Fields)	TQ364818	03-05-2006	2	RJS & TL
LBTH		Rhodeswell Road	Recently seeded grass verge between pavement & car park of Mile End Stadium	TQ364817	03-05-2006	7	RJS & TL
LBTH	Spitalfields	Brushfield Street	Not seen in 1995 location. Rough ground gone now	TQ358817	09-05-2006	None	RJS

			redevelopment completed.				
L.B. Islington	Clerkenwell	St. James's Walk	Base of wall	TQ315822	11-05-2006	c.10	RJS
L.B. Islington	Clerkenwell	Sans Walk	Base of wall	TQ315823	11-05-2006	>160	RJS
L.B. Islington	Clerkenwell	Woodbridge Street (north)	Base of walls	TQ315824	11-05-2006	c.50	RJS
L.B. Islington	Clerkenwell	Clerkenwell Close	Base of walls	TQ314822	11-05-2006	>50	RJS
L.B. Islington	Clerkenwell	Northampton Road (south)	Base of wall	TQ314823	11-05-2006	>30	RJS
L.B. Islington	Clerkenwell	Spa Fields (E. of Northampton Road)	In a flowerbed adjacent to Northampton Road	TQ314824	11-05-2006	>300	RJS
L.B. Islington	Clerkenwell	Skinner street	In pavement cracks	TQ314825	11-05-2006	2	RJS
L.B. Islington	Clerkenwell	Bowling Green Lane	At base of wall and two street trees	TQ313823	11-05-2006	>50	RJS
L.B. Islington	Clerkenwell	Corporation Row	At base of wall	TQ314824	11-05-2006	1	RJS
Dublin		Camden Place off Harcourt St.	Pavement edge and base of walls	O1533	28-05-2006	>350	RJS
Dublin	Chapelizod		Not seen where recorded in 1902-03 and 1987.	O1034	29-05-2006	None	RJS
Dublin	Ballsbridge/Sandymount		Not seen where recorded in various years from 1849 to 1987.	O1832	29-05-2006	None	RJS
LBTH		Royal Victor Place/Old Ford Road	Two square metres area of brick paving	TQ358832	07-06-2006	>90	RJS
LBTH	Nr. Bow Wharf	Junction of Regent's & Hertford Union Canals	Base of walls	TQ358832	07-06-2006	>70	RJS
LBTH	Mile End	Between Eric St. & Maplin St.	In front of garages	TQ366824	18-05-2006	1	RJS
LBTH	Poplar	Upper North Street	At the base of the walls of a terrace of boarded-up	TQ374810	02-08-2006	>400	RJS

			almshouses and at the pavement edge; mostly dried up and gone to seed.				
Royal Borough of Kensington & Chelsea	Kensington	Kensington Court	In crack at base of wall. No other plants growing. Same location as 1995 and 2001 records.	TQ258795	04-08-2006	2	RJS
L.B. Hackney	Stoke Newington	Hawksley Road	Concreted front area of no. 35.	TQ331863	07-08-2006	>20	RJS
L.B. Hackney	Stoke Newington	Hawksley Road	Concreted front area of no. 116. In this street in 1992.	TQ330864	07-08-2006	3	RJS
LBTH	Isle of Dogs	Manchester Road by George Green School	At base of a close-boarded fence at the edge of a paved area.	TQ384784	10-08-2006	>35	RJS
LBTH	Isle of Dogs	Manchester Road opposite George Green School	At base of street tree	TQ384784	10-08-2006	2	RJS